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Management Accounting in the United States - I

Excerpt from Productivity Report on Management Accounting by the Anglo-American Council on Productivity

"OH WAD SOME POWER THE GIFTIE GIE US
TO SEE OURSEL'S AS OTHERS SEE US!
IT WOULD FRAE MONIE A BLUNDER FREE US,
AND FOOLISH NOTION."

ROBERT BURNS

Managers and industrial accountants in this country have been provided with the unusual opportunity of seeing themselves as others see them through the publication by the Anglo-American Council on Productivity of the report of the Specialist Team on Management Accounting which visited this country during May and June of last year "to find out what accounting, costing and statistical information is provided for American Management at different levels: by what methods it is obtained and how it is used."

Two sections of this report of particular interest to the industrial accountant in this country are, with the kind permission of the Anglo-American Council on Productivity, being presented in the N.A.C.A. BULLETIN. *The section of the report dealing with the general survey follows. The March issue of the* BULLETIN *will contain the section of the report dealing with American Costing Methods.*

Introduction

1. It was inevitable, in carrying out the kind of investigation outlined in the previous section, that the Team should gather information about the nature of management itself.

2. The Report is addressed to management and to accountants in industry. This section is a general and non-technical one, and should be primarily of interest to management. The sections which follow cover in more detail and more

technically the various functions studied by the Team. The detailed sections are arranged so that those of interest to the "receiving end" come first—top management control, manufacturing, sales department—and those of interest to the "producing end" come last—costing, finance and accounts, purchasing, stock control and office management.

3. The terms of reference to which the Team worked were:

"To find out what accounting, costing and statistical information is provided for American management at different levels: by what methods it is obtained and how it is used."

All the Productivity Reports already published emphasise the great lead which America has in productivity in the industries studied. Previous teams have found that output per man-hour was higher and unit costs of a product were lower than their equivalents in Britain.

4. It was clear that American industry makes little attempt to measure productivity, preferring to rely on unit costs. It was convinced, with considerable justification, that productvity must be increased if the cost of the product was to fall.

Effectiveness of Management

5. In conducting the investigation as to whether accounting, costing and statistical information assisted American management in its drive for higher output at less cost, the Team had to take into account the attitude and practices of management.

6. In the opinion of the Team, after very careful consideration, the greatest single factor in American industrial supremacy is the effectiveness of its management at all levels. It is interesting to see that this finding has been confirmed by the Trade Union Team who said on page 51 of its report, *Trade Unions and Productivity:* "Efficient management set the pace of productivity in American industry—not because of altruistic belief in social progress but from necessity." To achieve and maintain its efficiency American management makes far-reaching use of the techniques of accounting and costing.

7. One of the measures of the effectiveness of management is its ability to use the means of production at its disposal—the men and machines—without overstraining either and to produce the greatest output at the lowest cost. One of the main differences between American and British practice in management is that American management recognises this. It colours its whole approach and outlook and determines the atmosphere in which it works.

8. The effectiveness of American management and accounting rests not on technical superiority but on their thorough application of techniques which are as well known in Britain as they are in the United States. It is no excuse for the present state of affairs to say that the only way to equal the Americans in this field is to adopt their whole way of life. Given the will and the sense of urgency, there are no valid reasons why British management and accountants should not be as effective, without in any way sacrificing any of the fundamental traditions of British society.

9. In an industrial society it is expected that the general standard of life will be continually improved. This is not a natural law. It can come about only if all give of their best, but the prime responsibility rests squarely on management. Management is the only group whose actions can be decisive in bringing about the desired increase in prosperity.

COMPETITION

10. American management's perception of the need for high productivity at low cost is sharpened by the knowledge of the penalty of failure, possible loss of business to competitors, and ultimate bankruptcy. Not for it the soft cushion and the comfortable feather beds of price agreements and quotas, with the feathers often concealed from the public under an attractive cover of what was called in the past "rationalisation". American management has, as the mainspring of all its actions, the well-founded belief that unit costs must be reduced each day and every day, week in and week out, year in and year out. This habit of thought is so natural to American management and accountants that it is taken for granted. They are aware that, if the unit costs in real terms are not continuously reduced, the standard of living will not rise and the raising of the standard of life is a religion to Americans.

11. The effect of volume on cost is well understood and the desire to maintain volume at the highest possible level determines many policy decisions. In price fixing the tendency is to keep the profit margin per unit low in order to get increased volume, which it is hoped will lead in turn to savings in cost due to greater machine utilisation, longer runs and more effective use of labour. Firms will intentionally restrict the range of products or varieties in order to get longer runs. This restriction in no way reduces the consumers' choice, because it obviously pays other manufacturers to produce different ranges.

12. As low cost is the main object of American industry no premium is placed on craftsmanship for its own sake. Only so much accuracy and refinement of finish are put into the article as are necessary if it is to meet the stand-

ard of the quality range for which it was originally designed. American management does not consider that quality and mass production are mutually exclusive. In its opinion it is only a question of organising machines, labour and inspection to work to the desired standard.

Fearlessness in Trying New Methods

13. The urge to reduce costs involves management in a restless search for cheaper and better methods of manufacture. Several of the companies visited had in the post-war years uprooted whole machine shops and relaid them in order to get a better flow of production. In one case a considerable investment in plant, with years of useful life still left, was entirely scrapped and new plant laid down to manufacture a different product because the management was convinced that the previous product had no future. American management does not ignore the fact that cost reduction may mean temporary difficulties for some—suppliers, employees or management—but it is recognised that in the end the national prosperity will be raised. It means fewer people producing more goods, and those who are no longer required are thrown on the labour market.

14. Changes are generally accepted as the condition of national progress and the raising of the standard of living. Labour so far has been prepared to accept them and in many cases changes, which apparently might have led to redundancy, have reduced costs so far that the products have found a wider market and the consequent increased demand has absorbed the labour rendered surplus in the first place.

15. The team of British trade union officials in its recent Report recognises the redundancy problems and says:

> "In this new industrial rôle which unions are seeking to perform there is need also to develop a more positive and realistic approach to redundancy. A rising standard of living can only be achieved by increasing productivity obtained from labour-saving machinery and technical processes and working skill. Redundancy, therefore, is inevitable unless increased production enables immediate re-absorption; but redundancy is not unemployment where full employment exists. Considerable emphasis, however, is placed on the need to encourage labour mobility and flexibility because it is becoming increasingly recognised that full employment means that there are more jobs than workers, rather than providing the redundant with jobs at the same trade and wage rates in the same locality. There are limits, in effect, to the distribution of industry based only on local social needs."

16. Possibly one of the differences in approach between the British and the Americans is that the Americans by and large are prepared to take the risk that the normal workings of the economy will take care of those who are redundant.

Nevertheless, according to the Trade Union Report already mentioned, "Dismissal pay or compensation designed to break down resistance to innovation is finding favour with many unions and companies." In Britain more positive action is required to compensate for the upheavals caused through redundancy. The attainment of flexibility in labour is worth a great effort and with our experience of labour transfers during the late war it should be possible to evolve acceptable solutions without any infringement of personal liberty.

Price Arrangements

17. The freedom of competition which exists in the United States undoubtedly is a most important reason for the drive for lower unit costs.

18. It is important to consider whether price agreements and quotas are having an adverse effect on the British economy by restricting technological advance. At present a Commission has been set up under the Monopolies and Restrictive Practices Enquiries and Control Act, 1948. To this Commission certain cases have been referred by the Board of Trade. It will obviously take the Commission a very long time to investigate all the various restrictive practices in existence. Meanwhile, it would be a real service to British industry if an independent commission could inquire into the nature of these agreements, report on their effect on British industry and express an opinion as to what would happen if they were removed.

19. The investigating body could also be asked to advise whether it would be in the public interest that all such arrangements should be made illegal without express Parliamentary sanction. Under present legislation price agreements and quotas are legal unless declared otherwise.

20. The constant emphasis on lower unit costs has made management in the United States look continually to the future. It has, in turn, demanded that industrial accountants should adopt the same attitude. This means that the definition of an accountant as one who "records, classifies and organises accounting data in an orderly fashion" applies only to book-keepers. Accuracy in recording the past is not enough—"the past is spilt milk anyway; the main thing is not to repeat the mistakes."

21. A new generation of managers has risen, many of whom have had training in management at the business schools attached to many of the universities, or at such institutes as the famous Massachusetts Institute of Technology. They have learned the value and utility of figure statements and what can be reasonably inferred from them. At the same time many accountants have realised that service to management is their main objective.

Organisation

22. The organisation structures which were met with during the visit were similar in many respects to those in this country. Companies made a point of publishing their organisation chart to all levels of management. The financial accounting and costing functions are strongly represented at top executive level in America. The majority of companies have a treasurer and a controller. In some large companies there is a financial vice-president as well as a treasurer and a controller. The controller often has under him a chief accountant. The distinction between the names and relative positions of the two functions are significant. The controller, as his name implies, is much more concerned with control through figures than with mere recording and he is always senior of the two.

23. The controller is normally responsible for all accounting and costing functions, for budgeting, for measuring performance against approved operating plans and standards and for reporting and interpreting the results of operations to all levels of management. He is constantly in touch with the problems that face management and is used by his colleagues to provide information at the very earliest stages of policy formation. This has had profound effects on the attitude of the controller to his procedures and he has developed the interpretative function of accounting and relegated the recording function to a subordinate position.

24. All the organisations studied emphasised that the controller belonged among top mangement. Both management and accountants realise that the primary purpose of accounts and costs should be to guide management in planning the future. This realisation springs from the desire of management to base its decisions on facts and reasoned forecasts. In spite of this acceptance, in principle, of the controller's function, many controllers realise that they must never lose sight of the need to show how figures and statistics can contribute to effective management.

25. There is an increase in the practice of agreeing a budget of expenditure or a standard of performance with the individual at each level and then comparing the actual performance with the agreed budget or standard. This practice is not limited to firms that have adopted systems of "standard cost control" in the form usually associated with that description. The advantage of this development is that as the individual manager, whatever his level, knows his responsibilities and the limits of his power, he feels a freedom and a confidence that let him get on with the job. This is one of the main reasons for the vigour of American management.

TOP MANAGEMENT

26. The presentation of information to the board and to top executive management is fundamentally different.

27. In most instances the board receives long tabulations of figures in great detail. These reports always include a balance sheet, profit and loss account, and often the position of stocks, disposition of funds or working capital, capital expenditure, forward commitments, sales, production, and other appropriate statistics. The board lays great emphasis on keeping stocks at the right economic level, and exercises, on the whole, a tight control over capital expenditure. The board is primarily concerned with the financial results and expects to be supplied in detail with a great deal of financial information.

28. Top executives, while naturally receiving copies of board reports and being briefed to discuss them with the board, do not regard these as their prime control statements. Forecasts and budgets are used extensively and are revised or recast as circumstances demand. This occurs with surprising frequency. Senior management pays far more attention to forecasts than to past results. It is interested in the latter chiefly as a means of setting targets for the future and controlling subordinates. The nearer a manager is to the shop floor or to the customer, the more he is interested in current results as a guide to immediate action and because he knows that his effectiveness will be judged by his success in reaching the target.

29. An interesting feature of several of the control statements was the variety of comparisons made. To control the execution of policy, the expenditure, sales, and profit are, in most instances, compared with at least a short-term budget and often with a long-term budget. The senior executives receive detailed profit and loss accounts for each division of the company's business. These are in many cases accompanied by schedules to show the standard cost of sales analysed by product and by territory. The profit and loss accounts and balance sheets are compared with the forecasts in some instances with the previous month and the corresponding month of the previous year. In one or two instances it is the practice to accompany the profit and loss accounts and balance sheets with projected balance sheets and profit and loss accounts for the next three months.

30. The practices in the companies visited are as varied as in a similar group of companies in Great Britain, but the general standard of management information is higher. Advanced companies are making great efforts to reduce the

routine reports given to the officers and senior executives. The most valuable information is conveyed to them in frequent discussions with the controller and his staff and in special reports dealing with current problems and likely developments. Summaries are prepared of the detailed operating results from the production shops for top management, and are accompanied by a verbal explanation.

GOVERNMENT INFORMATION

31. There is much external information available to top management. Government departments in Washington collect and issue valuable statistics on productivity, production, prices, consumer income, etc. The Government statistical departments are advised by a Business Advisory Committee and a Labour Advisory Committee, consisting of representatives of business and labour. In this way the Government is kept fully informed of the opinions of consumers other than itself.

32. The Division of Statistical Standards was set up under the Bureau of the Budget with the task of "co-ordinating Federal reporting services, to eliminate duplication and reduce the cost of such services, and to minimise the burden of furnishing information to Federal agencies". No statistics can be collected without the approval of the Bureau of the Budget which examines the forms on which they are collected. This prevents unnecessary duplication and improves the quality and usefulness of the statistics.

33. The Bureau of Labour Statistics collects figures of employment, earnings, man-hours, labour turnover, industrial expense, work stoppages and wage rates from about 140,000 establishments, representing 135 manufacturing industries, 20 major industrial groups and about 20 non-manufacturing industries.

34. The Department of Commerce is responsible for the census of manufacture, the census of business and the census of population. These are similar to those undertaken in Britain. It also prepares the estimates of national income and national product, consumer income, expenditure and savings. The latter estimates provide a valuable guide to trends in the level of purchasing power.

35. The Department of Commerce makes financial reports on business. It collects information on the relative position of large and small firms, the relative profitability of different industries, the rate of expansion of capital and liquid assets, the distribution of income, ratios of assets and profits to sales, and sources of borrowed funds. Comprehensive statistics of banking and related financial figures are prepared, weekly data being available on the conditions of the Federal Reserve banks. The Department also prepares statements of the

U. S. balance of payments covering economic transactions between the U. S. and other countries of the world.

36. A division of the Bureau of Labor Statistics collects detailed information on productivity, both as national indices and in selected industries. As the method of measurement is known, it is possible for any firm in the industry to assess its performance against that of the whole industry.

37. The value industry places on the collection and compilation of figures is shown by the fact that on two occasions, when financial appropriations were reduced and the Department concerned had to curtail the collection of figures, certain industries, through their trade associations, paid the Government to continue the service.

TRADE ASSOCIATIONS

38. Some trade associations publish statistics of sales, orders and costs of their industry as a whole, and these can be used by individual manufacturers to check their own achievement.

OTHER BODIES

39. There are several private and semi-public bodies which prepare a stream of statistics, many being analyses of the Government statistics, though some are the result of original investigation. These bodies are widely supported by industry and many executives spoke with enthusiasm of the summarised information which is provided.

DEVELOPMENT EXPENDITURE

40. The board of directors is often as a matter of policy prepared to spend capital more freely to enable a new product to be made or production to be increased than for the reduction of cost. It is argued that the gain or loss for not cutting costs is measurable, whereas the loss involved in missing an opportunity is immeasurable.

41. Considerable efforts are made to control expenditure on new projects. Careful assessments are made to establish the target, and the actual money spent is compared in detail with the budget as the project is developed. There is no disguising the difficulties of controlling development expenditure. Nevertheless, in the opinion of American management the efforts which are being made to do this assist in keeping expenditure down and in making development engineers cost-conscious.

42. The friendliness and understanding between the controller's department and the production department is remarkable. The controller's department is looked upon as an essential service to production.

43. The departmental managers or foremen and top management receive regular reports comparing actual results with the targets. Top management uses these chiefly for planning the future and setting new targets whilst the departmental managers or foremen use them mainly as a guide to the weaknesses in the day-to-day running of the departments. It is a general rule for the departmental managers or foremen to agree on standards of performance and budgets of expenditure.

44. The following are some of the subjects on which reports are most frequently given comparing actual performance with the budget:

Operator efficiency for individual operators and summarized as departmental averages,
Numbers of personnel employed in line working against the standard number allowed,
Price variations on purchases, analysed by commodities,
Scrap,
Lost time,
Machine Utilization,
Controllable overtime,
Indirect shop labor expense against the standard allowed,
Factory services expense against the standard allowed,
Maintenance,
Management and clerical salaries,
Power, light, heat, etc.

45. There is a wide divergence in the amount of information given to foremen. Some companies give them as much as they ask for so long as it has some bearing on their work. Others limit it to expenditure actually under the foreman's control.

46. Labour control is mostly exercised through standard times. The standard time taken is compared with the actual time and the efficiency of each individual man shown. In many instances monthly summaries of each man's performance are kept for a permanent record to assist in assessing his qualifications for efficiency pay and promotion or, alternatively, to show possible failure to achieve standards, which may result in transfer to other work. The indirect labour hours are often compared with the budgeted indirect labour hours on a daily basis. At the end of the month the cost in terms of money is shown.

47. Allied to the control of labour is the control of machine utilisation. Every effort is made to use the machines to the utmost and idle time reports are closely studied. Scrap is controlled with equal care because it is considered a waste of valuable production time as well as a waste of material.

Prompt Use of Figures

48. None of the returns, statistics and figures described here is unknown in this country but the promptness with which they are prepared was impressive. The daily statement, for example, is presented the following morning. Statements of figures are usually unaccompanied by written reports—again on the ground of speed. From top management to foremen and chargehands there is little fear of figures and there is a marked ability to absorb information from tabular or graphical form as quickly as, if not quicker than, from a written text.

49. The reports are often handed out personally by the controller or a senior member of the staff, with a verbal explanation of the figures, and the controller is prepared to answer questions on the spot. Action appeared to follow fast upon receipt of the figures. Reports are expected to be used, otherwise management is ruthless in scrapping them. Formal conferences are rare, it being implicit in the whole competitive atmosphere that each man is expected to do his job and to meet his budget, or else have a very good explanation.

Published Reports and Accounts

50. Published reports are of a high order, both in appearance and contents. Owing to the joint influence of the accounting profession and the Securities and Exchange Commission the published information is amazingly full.

51. Nearly every company, for example, publishes its year's sales, in value and quantity, the amount of capital expenditure for the year, in some detail. Many publish the average number of employees, the average hours worked and the average hourly earnings. The percentage earned on share capital, on sales and on each unit of common stock is shown. The working capital and the amount of profits employed in the business are stated. An interesting feature is that in some cases a statement reconciling the opening and closing cash position is published. The figures are often enhanced by a year-by-year schedule of comparison, extending over perhaps the last 10 years. Many companies' published accounts contain a great deal of information of general interest. In some instances these are distributed to employees and in others specially designed reports are prepared for this purpose.

Method of Obtaining Information

OFFICE ORGANISATION

52. Office staffs are divided broadly into highly trained executive and semi-skilled clerical. It is unusual to find highly skilled clerks. Accounting routines

are broken down until they can be done by intelligent people after short training. The staffs are flexible in that they are all capable of doing more than one of the simple routines. Great thought is expended on the office methods and routines, with the object of reducing costs.

INTERNAL AUDITING

53. In companies of any size there is often a separate department of internal audit. The internal audit department noramlly performs two functions:

(a) Checking the books for accuracy and checking procedures to see that there are no possible leakages;

(b) Advising on systems and procedures in the accounting, administrative or production side of the organisation, and seeing that these are effective and efficient.

OFFICE LAYOUT AND EQUIPMENT

54. The trend is towards large single offices which make for much greater flexibility. Physically the offices are attractive. Many have sound-absorbent tiles, and lighting, ventilation and decoration are of a high order. The offices are obviously considered to be as important as production shops and the same detailed consideration is given to the planning of operations.

55. To British eyes the provision of auxiliary office equipment, such as calculating machines, addressing machines and typewriters, seemed lavish. However, much loss of time is avoided because documents do not have to travel to and from calculating sections. The opinion was expressed that an investment of some £250 per clerk was justified. It is expected that the cost of any additional office machinery will be covered by savings in salaries within two years. By law the minimum wage in the United States is $30 per week.

56. The controller's close working with the management has made him acutely conscious of the time factor in his submission of reports. He is prepared to spend more money than would perhaps otherwise be necessary, provided this extra cost contributes to the speedy production of vital figures.

ACCOUNTS AND COSTS

57. A wide variety of methods of accounting and costing was seen. Nearly half the firms investigated use a system of standard cost control in the form generally associated with this title, but many more use some form of standards, forecasts, or budgets as a guide to efficiency. In general, there is no distinction between financial records and cost records. Accounting is one integrated whole.

58. Many companies have adopted accounting periods of four weeks duration.

59. The methods of costing and the provision of control figures can be grouped into four main types:

(1) Historical costs used for current control and for product costing;
(2) Historical costs used for current control, product costs based on standard costs;
(3) Standard costs used for the control of current operations, and the same standards used to calculate product costs;
(4) Standard costs used to control current operations based on short-term budgets, and long-term budgets used to calculate product costs.

60. It was exceptional to find a complete system of costing of type (1). Certain items, such as repairs, usually had to be spread on an estimated basis, but even in these instances a considerable amount of forecasting and budgeting was undertaken.

61. In type (2) where historical costs were used for current control and standards for product costs, the actual expenditure for the month was analysed to departments, and within the department to appropriate heads of expenditure, the current month's results being compared with the monthly average of the previous year.

62. To keep the product costs in line, actual expenditure is compared with the standard, and the differences are expressed as a percentage of standard, so that the standard cost is corrected to current conditions.

63. In type (3) where the same standards were used for current control and production costs the departments were credited with the standard value of their production and charged with the actual, and had to account for the difference. Under this scheme, the differences are used not only for control but for adjusting the standard cost to current prices if required.

64. An interesting example of the control exercised by a company using this method was when the manufacturing department showed a considerable loss due to processing non-standard material. At first this loss appeared in the departmental statements, but the controller, after investigation, charged it to the purchasing department, who then claimed from the supplier. He accepted the claim but stated that, in future, he would be unable to maintain the material to the specification unless he could get a substantial increase in price. The company's research department then took up the problem and succeeded in evolving an alternative process, resulting in a much cheaper product.

65. Where type (4) is in operation, the product costs are based on long-term budgets, possibly five years, both of expenditure and volume. The practice

appeared to be that in the engineering industry single-shift working, and in the textile industry double-shift working, was taken as the base. This meant, in effect, that prices were not reduced in times of boom through abnormally high volume, nor were they increased in times of depression through abnormally low volume.

66. For control purposes, fresh budgets of volume and expenditure were fixed for periods varying from a month to a year, depending on management's requirements and the nature of the company's business. The budgets also were usually set for such a period as enabled the expenditure for control purposes to be treated simply as fixed and variable, semi-variable being ignored. This often required the budgeting of manufacturing and volume variances.

67. Marginal costing, as such, appears to be comparatively little used. One company makes use of it for the calculation of product costs, but for control purposes uses a scheme of standard costs and budgetary control.

68. The differences are thrown up by the control scheme and are written off as fixed charges in the profit and loss account. The essence of the scheme is that only directly chargeable expenses are charged to the product; all other expenses, mostly of a fixed nature, are charged direct to the profit and loss account.

69. Product costs are created by calculating the directly chargeable expenses and then adding a percentage to cover fixed charges and profits.

COMPARISONS

70. Many different comparisons are often used in the same company to focus attention on a particular problem. The current month's figures are compared with the same month in the previous year and with the previous month, and figures for the last three months are often given. Comparisons are also regularly made with the long-term and short-term budgets. Trends in the form of moving annual totals are sometimes found.

71. Wherever possible, comparisons are made with other companies in the industry, either through trade association returns or Government statistics.

FIXING OF BUDGETS

72. The fixing of budgets is very closely allied to detailed forecasting based on market research. The normal method is to forecast for existing products the total demand and the company's estimated share in the potential market. In arriving at the estimate, population and income statistics and field surveys are

used to supplement the company's knowledge of the market and the general economy of the country. Many outside sources of information are also used.

73. As soon as the sales forecast is complete, it is passed over to the controller's department who build up financial budgets and forecasts, balance sheets and profit and loss accounts and link these with the production budgets. Some companies assume several different sales volumes, and budget a balance sheet and profit and loss account for each level.

74. In building up budgets and forecasts it is essential to have an accurate measure of expenditure and man-hours throughout the productive processes. Time-study engineers are employed in nearly every plant. In deciding on the establishment of the budget, most of the jobs in an undertaking are evaluated. The job evaluation techniques are similar to those in this country but are much more widely used.

Education for Management

75. American industrialists, like all others, are well aware that success ultimately depends on people and that the people who can contribute most to the success of the company and who can make or mar the efforts of all the others are management. At the beginning of the century there was already support for the idea that men could be trained for management by attendance at an academic institution. This led to the establishment of schools of business in a number of America's leading universities. Their success has convinced Americans that it is a practical proposition.

76. Four of these schools of business were visited. The work being done there is impressive and must be attributed in a large measure to the quality of the staffs. These consist of practical men who are sufficiently knowledgeable to be paid fees by industry for their advice. They are not, and under this system never can be, academic in the sense that they are cut off from the day-to-day problems of an industrial society.

77. American business men support the schools of business by serving as governors, by making contributions to the funds, and by helping to place the graduates.

78. An interesting development similar to the Administrative Staff College at Henley is the Harvard Advanced Management Programme. This is intended for men selected by their own organisation as being capable of assuming greater administrative responsibilities. The course is of 12½ weeks' duration and is devoted to the concentrated study of appropriate subjects.

Standards to Meet Product Changes

by A. L. HUNT and H. J. WALKER

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A procedure under which standard costs for control purposes are revised promptly to reflect new materials and methods of manufacture while standard costs for inventory valuation are less frequently brought up to date is described in the present paper. The principal effects of utilizing divergent standards concurrently are considered.

IN THE OPERATION OF A standard cost system, there periodically arises the question, "When should we change our standards?" Essentially there have been two approaches to the problem of how often to change finished goods standard costs and these different approaches should be kept in mind when originally determining policies regarding the frequency of standard revisions.

The Differing Emphases of Basic and Current Standards

One idea is based upon the belief that the standard cost is principally a tool for the accounting department to utilize in order that it may simplify its procedures. In line with this the standards should be revised as seldom as possible. This type of standard grades toward basic standard cost and is generally not changed oftener than once a year, quite frequently not for several years.

The opposite viewpoint is that a standard cost is principally a yardstick for measuring the efficiency of production processes and, as such, should be revised as often as possible. This is more commonly known as current standard cost and is generally changed with each change of a product's makeup.

Each of these two versions of standard cost has its shortcomings. Each has its advantages. In order to see more clearly the points of differentiation, we can apply the principles of each to a specific problem and then observe the results in each case.

The Case of the More Economical Box

Let us assume conditions as they appear in the ABC Manufacturing Company, a concern operating under a standard cost accounting system and valuing its raw material inventories at standard. ABC produces several products, one of which, Product X has a standard cost of $3.50. This particular product has been packaged in a two-piece box, the standard cost of which is 21¢ for the top and

9¢ for the base. ABC's purchasing department has been approached by a vendor who proposes to sell the company a one-piece box, having the same scheme of color and design as the present one and with identical copy printed on it, so that the final product would appear the same as with the two-piece container.

This one-piece box can be purchased for 12¢, thereby effecting a material saving of 18 per cent when compared with the old two-piece affair. The industrial engineering department was consulted by the purchasing agent. The engineers estimated that the one-piece box would require additional labor amounting to 1¢ per unit because of difficulties encountered in assembling the product. Additional overhead costs apportioned to the product on the basis of direct labor utilized would amount to another 1¢ per unit, so that the overall saving from adoption of the new purchase would amount to 16¢ per unit as follows:

Anticipated Saving Resulting from Adoption of New Style Box—Product X

Cost of present two-piece box:		
Top	21¢	
Base	9	
Total		30¢
Cost of proposed one-piece box		12
Material cost reduction		18¢
Less: Additional labor required	1¢	
Overhead on above labor	1	2
Total saving per unit, Product X		16¢

It was determined that there would be no extra costs involved in packing cases, shipping expenses and the like. Management studied the proposed box and its effects and, after several weeks of deliberation, approved the new package which was scheduled for full production. Then arose the problem of how to treat the change on accounting records.

If basic standard costs are used, no new standard would be set up for Product X, since the product essentially is unchanged. Shipping costs, advertising and administrative expenses, selling price, sales discounts, etc., remain the same. To account for the reduction in cost then, there are two choices.

1. The new box can be costed at a new raw material standard cost, charged to work in process at this standard, and variances between standard and actual finished goods costs of Product X could be explained in part by referring to the new box, its lower price, and the higher labor costs it necessitates. This, however, might fog material and labor variances which ordinarily would be important enough for individual consideration but which might not appear as clearly when combined with this new factor of price differential in addition to efficiency variance.

2. An alternative, which would serve to reduce material variances arising from process to their level of purely manufacturing variances, would be to carry the new box in the raw material inventories at a standard which would equal the former standard for the top and bottom of the two-piece box combined. Under this system, "profits" would be taken on the basis of materials purchased, as a result of large material price credit variances occurring each accounting period, rather than on the basis of material manufacturing variances. Manufacturing variances arising out of the additional labor operations necessary to the new box would still develop in process. A fault of this method lies in the fact that raw material inventories would not be correctly valued but would be overstated by the amount of difference in cost between the two types of boxes. Utilizing either of these alternatives, general accounting's treatment within the organization would not be changed. Only those transactions which pass through cost accounting would be affected.

If current standards are used, a new finished goods standard cost for the product would be computed. Variances appearing under this procedure would reflect true variances of current operations, both manufacturing variances and price variances. General accounting, however, would face a problem here which was nonexistent where basic standards were used. The problem lies in the valuation of finished goods inventories. Here a choice of method must be made between:

1. Revaluing the finished goods inventory on hand to reflect the standard cost of the new type product and valuing all products, both old style and new, at the new standard (which in itself leads to many additional problems) or
2. Maintaining separate inventory controls of both the old style and the new style until all the old have been sold.

Interim Standards for Control

Faced with just such a dilemma in our organization, we evolved a system which has proven very satisfactory for our needs. Rather than choose either basic standards or current standards, we chose an in-between course and formulated what we call a "component change standard." This in-between course enables cost accounting to retain the advantages of current standards and general accounting to retain the advantages of basic standards. Our basic standards, once set up, are changed only infrequently. If we were faced, however, with a problem such as that given above, we would set up a component change standard cost incorporating the lower material cost of the one-piece box and also the more correct labor and overhead figures required because of necessarily changed techniques in production. When costing production out of work-in-process we would use this component change standard, but the finished goods inventory would be charged at the unchanged basic standards.

To reconcile this seeming paradox we have set up a ledger account entitled "variances due to product component changes" to which we charge or credit the difference between basic standard and component change standard. In following

this system, then, we find true manufacturing variances and price variances in their respective variance accounts and, in the component change variance account, we have the cumulative result of any and all component changes which have been made. If desired, this component change variance account may be maintained as a control account with subsidiary accounts set up for each individual component change.

Getting Down to Cases on the New Box

To exemplify the points involved in the above discussion, hypothetical figures for Product X under each method are given in the table in Exhibit 1. Identical production is given for each of the two months for which data is supplied and manufacturing variances due to material waste or labor inefficiencies have been set up the same for each month. The only factor giving rise to differences between the operations of the two months is the new box. Overhead is applied at 100 per cent of direct labor costs.

In Case 1 where finished goods standard costs remain unchanged, actual material costs have decreased greatly, while labor costs and resulting overhead apportionment have increased. The credit manufacturing variance for material is now made up, not only of a $300 debit for actual wastage but also an $1,800 credit arising out of the fact that the production department is charged at 12¢ per box instead of the old actual cost of 30¢ per complete box, which is the amount included for the box in the finished goods standard. Labor variances too reflect more than one cause. There is a credit variance of $240 arising out of manufacturing efficiency and there is a debit variance of $100 brought about by the additional labor required on the new box. Explanations must be forthcoming whenever reports are issued which display these multi-factor variances.

In Case 2 standard costs are again unchanged but the boxes are charged to production at the old raw material standard. A danger which exists where this system is utilized is that, while purchasing will receive credit for the reduction of raw material costs, production may receive the brunt of criticism for increased labor and overhead costs which were caused by the new style box.

With current standards being utilized in Case 3, both standard and actual costs have been reduced and the variances are identical with those of the first month. To accomplish this, however, it was necessary to change standards throughout the accounting departments, including the valuation of finished goods inventories and, in those instances where necessary, to maintain separate inventory controls of old and new style products.

Case 4 is the result which would appear under our company's method. As

PRODUCT X - PRODUCTION COSTS AND VARIANCES

Finished Goods Standard Cost:

Material	$2.00
Labor	.75
Overhead	.75
Total	$3.50

Production, Month 1 - 10,000 units (2 piece box utilized)

	Standard	Actual	Variance
Material	$20,000	$20,300	$ 300
Labor	7,500	7,260	(240)
Overhead	7,500	7,260	(240)
Total	$35,000	$34,820	$ (180)

Production, Month 2 - 10,000 units (1 piece box used)

Case 1 - Basic standard cost system
Material costed to production at the new cost of 12¢ per box

	Standard	Actual	Variance
Material	$20,000	$18,500	$(1,500)
Labor	7,500	7,360	(140)
Overhead	7,500	7,360	(140)
Total	$35,000	$33,220	$(1,780)

Case 2 - Basic standard cost system
Material costed to production at the old standard of 30¢ per complete box

	Standard	Actual	Variance	Material Price Variance
Material	$20,000	$20,300	$ 300	$(1,800)
Labor	7,500	7,360	(140)	
Overhead	7,500	7,360	(140)	
Total	$35,000	$35,020	$ 20	$(1,800)

Case 3 - Current standard cost system
Finished goods inventories valued at new standard

	Standard	Actual	Variance
Material	$18,200	$18,500	$ 300
Labor	7,600	7,360	(240)
Overhead	7,600	7,360	(240)
Total	$33,400	$33,220	$ (180)

Case 4 - Component change standard system
Finished goods inventories valued at old standard

	Component Change Standard	Actual	Variance	Component Change Variance
Material	$18,200	$18,500	$ 300	$(1,800)
Labor	7,600	7,360	(240)	100
Overhead	7,600	7,360	(240)	100
Total	$33,400	$33,220	$ (180)	$(1,600)

EXHIBIT 1

with current standards, manufacturing variances remain the same as they were the first month, but in the new account, "variances due to product component changes, "we have the net result to the company of putting into effect a change in the makeup of this product. The $33,400 amount shown in this example as component change standard cost represents the credit to production for the month. Finished goods would be charged at the old standard of $35,000 and the difference of $1,600 is shown as component change variance. This method of handling is beneficial, too, in that raw material inventories are priced at a new standard, thus valuing them more closely to actual cost.

This procedure can be used advantageously for any minor change in a product, whether such change be an addition to, deletion of, or alteration in some component part, so long as the final product remains essentially the same. Where a major change takes place in a product, however, serious consideration must be given to the possibility of changing basic standards.

Meeting Product Change and Inventory Valuation Problems

Our organization has a rather extensive research program which is constantly striving to obtain better results from our products, more efficient methods of production, and packages with more consumer appeal, as well as planning for new and allied products to add to our line. With a sizable research budget operating to change components frequently, we have found extremely useful the method of accounting for such changes which has been described. It has been useful both from a standpoint of valuing inventories and explaining production variances.

Moreover, no serious disadvantage has arisen out of valuation differences between standard and actual costs of the finished goods inventories. This is particularly important to us because our finished goods inventories are located in warehouses throughout the country. The fact that finished goods inventories can be valued at a basic standard continuously, regardless of what the component change standard might be at the moment, is particularly helpful. In those instances in which inventories or finished products represent an unusually small percentage of a concern's assets, there is no offset to this advantage. In cases in which such inventories represent a considerable portion of the assets, the disadvantage of over-stating or under-stating finished goods values can be overcome by providing an approximate reserve for gain or loss on revaluation of inventories.

Property Records for Insurance Purposes

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The theme of this article is that maintenance of insurance protection for a company against fire loss does not either begin or end with taking out policies to an amount determined "off the cuff." Owners' responsibilities, with respect to fire insurance, which demand property records with special characteristics, are given rounded review. Three principal provisions of fire contracts serve as a starting point for discussion.

THE SUBJECT OF THIS PAPER cannot be presented intelligibly without at least some mention of a few of the many uses of property records for other than insurance purposes. Three such uses may be cited.

Common Uses of Property Records

One of the most frequent applications of property records in the past fifteen years has been for control of depreciation for Federal income tax purposes. The impetus given this application was primarily T.D. 4422, promulgated in 1934. The use of property records for this purpose there spelled out still governs despite a need for broader treatment of depreciation as taken on the Federal income tax return. A further application of property records and one which has received increasing attention in the last ten years relates to cost accounting. The O.P.A. with its diverse activities, war contracts and contract cancellation problems etc., emphasized the necessity of adequate property records for cost accounting purposes. The third application to be mentioned, apart from the use of property records in connection with insurance, received its real impetus during the period of World War II. This application concerns stewardship or accountability to others for property units. Many industries were operating property leased from Government agencies and were required to account for the existence and location of property under lease at all times. Many of these companies encountered difficulty at the termination of their leases because of the looseness with which that accountability was maintained.

Pertinent Provisions of Standard Fire Contracts

These uses of property records are not without some relevance to the special subject of this paper which, however, merits independent presentation. I would like to review the fundamentals of the insurance problem and its relationship

to property records. I believe that a review of these matters is well within the interests and responsibilities of cost accountants. Fire losses have been running above $50,000,000 per month for the past several years. The means by which owners of insurable property are protected from the financial impact of fire loss are highly pertinent to good financial management.

To start with, let us examine a typical fire insurance policy. Most insurance policies are prepared on standard forms with the usual provisions for execution by authorized officers of the insurance companies. Insurance policies have standard provisions, among which are the finely printed paragraphs of text on the reverse side, numbering some 165 lines. The insurance policy is a legal contract. It is negotiated by an agent who is a representative of the insurance company, but the contract itself is between the insurance company and the property owner and provides for certain conditions to be met by each party.

On the first page of the standard policy, the following will be noted:

> "In consideration of the provisions and stipulations herein and added hereto and of $———premium, this company does insure to the extent of the actual cash value of the property at the time of loss, but not exceeding the amount which it would cost to repair or replace the property with materials of like kind and quality."

There is evidence here of a definite relationship between the insurance premium and the *actual cash value of the property at the time of the loss.* In other words, in order for an insurance contract to be written, there must be knowledge of actual cash value of the property covered. Also in the fine print on the reverse side of the ordinary policy form, in lines 90 to 122, there will be found provisions applying to "Requirements in Case Loss Occurs." These suggest that insureds must be well acquainted with their properties and, again, cash value is stressed:

> "The insured shall give immediate written notice to this company of any loss and . . . furnish a complete inventory of the destroyed. damaged and undamaged property showing in detail quantities, costs, actual cash value and amount of loss claimed, and . . . if required, verified plans and specifications of any buildings, fixtures or machinery destroyed or damaged."

The foregoing provisions and the cited relationships of insurance to property values prevail on all standard fire insurance policies. Some policies may have additional provisions, such as the co-insurance clause. This is a grossly misunderstood and misused provision. The co-insurance clause normally reads somewhat as follows:

> "The insurance company shall be held liable for no greater proportion of any loss than the amount hereby insured bears to 80% (or 90%) of the actual cash value of the property described herein, at the time when such loss shall happen."

When this clause is attached to the insurance policy it becomes an additional provision in the insurance contract through which certain insurance premium reductions are given to the property owner, in return for which he must comply with the specified relationship of insurance to property values at all times. Once more the standard of measure is actual cash value at the time of loss.

Owners' Responsibilities: 1. Value of Property to Be Insured

The insurance policy is a legal contract calling for payment of indemnity in case of fire. The insurance company as one of the parties knows thoroughly what its obligations are under the terms of the contract. On the other hand, the property owner—the second party to the contract—is ordinarily grossly weak in his understanding of his obligations under this contract and ill-prepared to meet them. We may, therefore, profitably examine the property owner's responsibilities in more particular.

First of all it is the owner's responsibility to determine the actual cash value of the entire property to be insured, as a basis for writing the insurance contract and determining the premiums. The files of fire loss experience are full of incidents in which agents have assisted in some manner or other in determining the total amount of insurance written on a specific property. These files do not make pleasant reading. They all resolve into a clear cut legal responsibility on the part of the property owner to make this determination.

One example will suffice. An agent for an insurance company prepared property value information as a basis for writing insurance. The property experienced a substantial fire within a few weeks. The coverage had been spread among several companies and, although the company represented by the agent recognized a responsibility in connection with the adverse effect of the valuation upon the insured's recovery of the loss, the other insurance companies did not and the entire matter went to the courts. This case was settled after approximately two years of litigation by the application of lines 123 to 140 in the standard insurance contract.

Owners' Responsibilities: 2. Loss and Damage Data

The responsibility of the property owner is even greater in connection with a fire loss. As has been stated, the terms of the insurance contract provide that, in the event of loss, the property owner shall "furnish a complete inventory of the destroyed, damaged or undamaged property showing in detail" information under the various heads which have already been quoted. There is no way outside of pure guesswork that a loss can be determined without such detailed data.

The fire loss experience files are full of instances in which property owners were not ready to comply with these terms and have had to rely on purely arbitrary settlements by adjustors. It is the function of adjustors to examine any and all data submitted and, if the required data in connection with the damaged property is lacking, the only alternative left is an arbitrary settlement with consequent lack of complete satisfaction.

In a recent case the fire-damaged property amounted to about $500,000 in value or roughly one quarter of the total plant. The only existing "property record" was a plant ledger maintained by the accounting department and including only costs which had been capitalized. No costs for piping and wiring had been capitalized and these two classes alone constituted about one third of the final loss claim. The only practicable approach in this case, as in many others, was to build up an inventory after the fire, based upon the memory of foremen and workmen and from evidence available in the ruins of the fire. The preparation and processing of this make-shift inventory involved more in time and costs (by several times) than would have been necessary to prepare the inventory before the fire and to maintain it in line with the property and the results were far less reliable.

A property owner must be able to present at the necessarily indeterminate time of a fire loss, the quantity, identification and value of any property destroyed or damaged. It should be clearly recognized that the greater number of fires are of a partial nature requiring information on quantity, identification and value of property units in certain areas of a plant. This means that a property record to be used for insurance purposes must show the specific location of such property units. Plans and specifications of buildings should be maintained in fire proof vaults so that an inventory of any portion of any building can be prepared at any time.

Owners' Responsibilities: 3. Co-insurance

Compliance with the co-insurance clause, where it exists, is likewise the owner's responsibility. This is a refinement of a fundamental provision which requires the property owner to take the responsibility for determining the amount of insurance to be carried. To repeat what was stated earlier, this clause provides that, for a reduced premium, the property owner must maintain a certain specified relationship of insurance to property values at all times. Failing to do so, he is penalized in any loss settlement to the extent of any deficiency in that compliance.

For example, if, according to the actual cash value of the property at the time

of loss and terms of the co-insurance clause, $100,000 of insurance should have been carried but only $50,000 was carried, the property owner will be indemnified only to the extent of one-half of the actual cash value of the property destroyed or damaged. He is "co-insurer" as to the remainder of the loss. In 1948, some 70 per cent of the fire losses involved the co-insurance penalty. It can thus be appreciated that chances of becoming co-insurer are not remote. Obviously a co-insurance clause cannot be completely complied with unless the value of the property is known at all times.

In fact the three matters which have been cited from the standard fire insurance contract and have been discussed, call for a set of property records from which the owner can obtain at any time the location, quantity, identification and actual cash value of each unit, any group of property, or all the property. These responsibilities are different from the requirements of property records for tax, cost accounting and accountability purposes (the uses of property records mentioned at the start of this paper), but they pertain to the same property and must usually be incorporated in the same records.

What then are the minimum requirements of property records for insurance purposes? The form is not too important as long as the detail available meets the requirements called for by the insurance contract. Indeed, the form may vary materially with the nature of the property and the other uses to which a company may want to apply property records.

Records Must Cover All Insurable Property

Nevertheless, there are certain requirements related to property records for insurance purposes. First they should be based upon the property in use and existence and not just property which is shown by the accounting records as having been capitalized. This latter basis can very easily lead to a substantial element of co-insurance and also to a lack of supporting detail in case of loss. Such classes of property as tools, dies, fixtures, jigs, piping, wiring, and machine installation costs frequently fall into the category of costs which have been expensed. These items may constitute a sizable portion of the fire loss and their inclusion in a documented claim may very well mean the difference between the application or nonapplication of co-insurance or the settlement of a loss on a factual or arbitrary basis.

"Pricing" of Property for Insurance Purposes

Secondly, property records convertible to property inventory for insurance purposes must be priced in a manner to reflect the actual cash value in accordance

with the terms of the standard policy. Actual cash value has been defined and considered by courts in insurance valuation cases as the cost of reproduction new less depreciation. In other words, as the initial step in pricing, the cost of reproduction new currently must be known.

During the last eight years of erratic and rapid price changes this has been a difficult problem. Solution of this problem need not be refined to the point at which a determination of the cost of reproduction is made daily, weekly or monthly. An annual review of these data is normally all that is required. The records, however, should be set up in such a manner that interim reviews on a broader basis may be made for insurance guidance when conditions warrant.

There are three broad approaches to the problem of pricing the property inventory on a cost of reproduction basis. The first is a detail one, such as would be followed in an accurate appraisal and having all prices supported by quotations from dealers and manufacturers of equipment, with consideration given to labor rates and practices in the specific communities.

Two Types of Price Trend Adjustments

Alternative are to use price trends of either a specific or a broad nature, applied to original costs. One of the first limiting features of either of these procedures is that the original cost base should show the full and complete normal cost new if price trend statistics are to be applied with any degree of intelligence and accuracy. This condition to the use of price trend data is very infrequently met. Plant property accounts are customarily the most conglomerate of all. In addition to having costs of a wide range of years and economic dollar levels, the accounts will include excessive costs, such as were encountered during the war period on cost-plus contracts, and subnormal costs, such as acquisitions from W.A.A. or D.P.C., or outright second hand purchases. Another limiting factor in basing adjustments on original costs is that only costs capitalized according to some accounting policy, and not necessarily to the extent of the existence of the insurable property, show in original cost records.

However, the possibility of using price trend data need not be dismissed summarily. As suggested, such data may be applied broadly or specifically as related to the particular property items. There is a sizable margin of difference between these two approaches, of which the average business man is not aware. The hazards involved in the use of price trend data by any but experienced personnel are numerous and serious.

There must be a starting point accurately tied in with dates of acquisition. To make the price trend data applicable with any degree of accuracy, these starting

point costs must be segregated by classes having the same price trend characteristics. This is not a simple task nor one for a novice to tackle. The factors involved have become more and more complicated since World War II.

If Specific Price Indices Are Used

Consideration of specific application of price trend data is particularly in point. For example, buildings need to be studied by an experienced engineer to determine the relative composition of each building as a basis for segregation into price trend characteristic groups. A review of building cost change data will clearly show the problem involved in measuring, with any degree of accuracy, the trend in cost of a building which has a composition of building trades and materials differing to any extent from those upon which the trend data is based.

To illustrate that this entire matter is not an unnecessary refinement, a summary of the cost trend in certain trades and building materials between 1939 and 1948 may be helpful. It should be clearly evident that with cost trend variations as wide as these consideration *must* be given to the composition of each building if results of a reasonable degree of accuracy are to be expected. The figures follow:

Common labor	Plus 210%	2" Lumber	Plus 230%
Masons	Plus 58%	Structural steel	Plus 46%
Common brick	Plus 45%	Paint	Plus 180%

Machinery and equipment are in like case. The costs of machinery and equipment must first be segregated by classes having the same general price trend characteristics before current value adjustments may be applied to historical cost. This segregation cannot always be accomplished by simply classifying machinery by manufacturers, as frequently different equipment made by the same manufacturer varies considerably in price trend characteristics. Again the price trend segregation of original cost data is not an unnecessary refinement if it is intended to measure costs of reproduction with any degree of accuracy.

There are two examples available, which are by no means extreme cases. They have been taken at random from actual records. In a printing plant the cost of reproduction of various types of equipment ranged as follows between 1945 and 1948:

Class #1 Equipment	40%	Class #3 Equipment	74%
Class #2 Equipment	46%	Class #4 Equipment	25%

There were sizable dollars amounts involved in each classification. Certainly a variation from 74 per cent to 25 per cent in value increase is important in

that whether the high or the low rate applied could very well represent the difference between a satisfactory and an unsatisfactory insurance settlement. In a case of a rubber processing plant, one class of equipment varied in cost between 1944 and 1948 by 19 per cent and another class of equipment in the same plant for the same dates varied 49 per cent. Both of these groups of equipment items represented sizable proportions of the total plant investment.

The point intended to be illustrated here is that, if price trend data is to be considered, an analysis of the costs and types of property must be made by experienced people if the results are to be usable. It has been done frequently by qualified personnel where companies have the proper information available in their records in regard to costs. Where companies have property of a sufficient extent and where tabulating equipment is available, such records can be developed rather easily by allowing a place on the tabulating card for price trend classification code. This permits the segregation of costs by years of acquisition and price trend characteristics for the convenient application of corresponding price trend data.

If General Price Indices Are Used

The utilization of general price trend data might involve applying established price trends to possibly two broad categories, perhaps buildings for one and equipment for the other. If general price trend data is to be applied to acquisition costs, there exists so large a margin of error that, to me, it represents more of a hazard than fire itself does. By using such broad price trend data, a false feeling of security is engendered which will only be disclosed in its true nature in the event of fire. Then it is too late.

The Engineering News-Record has published a chart showing a comparison of eleven different index numbers dealing with building and construction costs. It does not take a mathematician to see that a considerable margin of error could exist in applying any one of these cost indices to a specific case. As of the end of 1948, there is a spread of 170 points between the highest (500) and lowest (330). This, of course, is an extreme but it does illustrate the possible error involved.

In a recent case in which the necessity for a detailed repricing process was questioned, it was disclosed that two industrial buildings classfied as brick and steel frame buildings had an appreciation between 1938 and 1948 of 100 per cent and 124 per cent, respectively. Had the national average construction cost trend as published by The American Appraisal Company been applied to these same buildings an appreciation of 143 per cent would have been indicated. This dif-

ference was due to the composition of the buildings under consideration and to the variations in labor and material prices between the specific community and the national average. It is certainly a difference of sufficient magnitude to warrant careful attention.

There is a similar margin of error involved in the application of price trends on an over-all basis to machinery and equipment. There are fewer index services available on this class of property because of the technical features involved. Quoted below is a comparison of the percentage increase between 1939 and 1948 shown by one of the published trends and that revealed through a detailed pricing process employed by my company:

INDUSTRY	A. A. CO.	PUBLICIZED TREND	MARGIN OF ERROR
Paper	225%	163%	28%
Metal	190%	165%	19%
Rubber	200%	167%	17%
Wood working	185%	164%	12%
Printing	212%	142%	33%

The margin of error involved in the use of general price trends is thus so pronounced and sizable that the results derived therefrom would be of questionable usefulness.

"Depreciation" in Determining Value

Whatever the basis established for considering the costs of property reproduction, the property owner must then consider the basis for depreciating cost of reproduction to the actual cash value as recognized by insurance companies and adjustors. This is a somewhat different meaning than is usually attached to the word "depreciation" by accountants who consider depreciation as the procedure of writing off stated amounts annually for income tax or cost accounting purposes.

Depreciation for insurance purposes, on the other hand, reflects mainly the physical condition of the property and its use and reflects also the repairs and maintenance costs which have been expended on it. Age alone is not a significant factor from this standpoint. Depreciation for insurance purposes rarely exceeds 50 per cent against any specific unit or property group as long as the unit or group is being used to its full extent in the manner for which it was originally designed. It is practically a necessity either to get expert advice on the factor of depreciation in arriving at actual cash value or to realize that, in the settlement of a loss, the company procedure may involve a substantial difference of opinion and a substantial difference in dollar recovery.

Property Segregations Required by Fire Policies

We have considered, to this point, that property records for insurance purposes must include all property in use and in existence and must be priced for determination of actual cash value. Consideration must now be given to a third property record requirement for insurance purposes, the segregations called for only by the insurance contract. This necessitates a segregation of figures between the insurable and excluded portions. The latter category means those portions of the property normally not covered, such as underground foundations, footings, and underground piping and ducts. There may be other exclusions, depending upon the insurance form applying to the property under analysis.

The segregation may also be by fire risks. Separate risks are usually designated by the inspection bureau of the state under certain technical definitions, to determine the boundaries of each one. A separate risk usually consists of an area surrounded and protected by fire walls in which openings are protected by automatic doors, etc., and is designated as a "building". This division by buildings may be, and frequently is, different from the building division used for accounting or other purposes.

It is essential to accumulate the valuation data in accordance with these building divisions for average rate making purposes. The property owner is frequently required to file with the inspection bureau a statement of valuations of the property by buildings. Each building has a separate rate, depending upon type of construction, occupancy, exposure, and the only way an average rate for the entire plant can be determined is by weighting the rate assigned to each building in accordance with the actual cash value in each building. Thus the correct segregation of these figures has a definite effect on the insurance rate and the resulting insurance premiums.

The next segregation required is between buildings and contents. This segregation may and often does differ from the accounting treatment of the same elements. The insurance form applying to a particular property usually defines what is considered as buildings and what is considered as contents.

Keeping the Property Inventory Up-to-Date

Since the entire problem of insurance and related property valuation is a continuing one, requiring current knowledge of existence and actual cash value of all property units at any time, thought must be given to a method of keeping such property records up-to-date. Many good intentions in respect to property records have gone astray due to the lack of upkeep. Property records are a moving picture of plant properties and not a snapshot. They must reflect property

changes as they occur daily and the information must be compiled in such a manner that the identification, location, and actual cash value can be determined on short notice. This need not be a large or additional chore. The property record requirements in connection with the insurance problem can ordinarily be worked into the procedure normally followed for the control of plant property accounts for tax and accounting purposes.

Of necessity the cost and work involved in perpetuating the records must be recognized. They must not become so costly that the expense involved will be out of proportion. On the other hand, the responsibilities imposed by the insurance contract must be faced. According to the standard contract, the owner must be able to prepare a statement of the quantity, location, identification and actual cash value of any portion of the plant at any time.

The maintenance of reasonably accurate property records for accounting, tax, or insurance purposes requires periodic policing by someone familiar with both the property and the property records. It is a common occurrence to have a good set of property records prepared, only to find after several years of maintaining such records on the basis of shop orders, information slips, etc., that they do not represent the property as currently existing. This condition can be disclosed only through a periodic spot checking of the property with the records or vice versa.

Loss Settlements Can Be Smooth

There was cited earlier in this article a case to illustrate the lack of insurance information in many property ledger records which are perpetuated from accounting information only. This was not an exception but, from my experience, a rather common occurrence. About the same time as the fire loss mentioned was being processed, we experienced another one in the same general area. In this second case, however, a complete inventory and valuation of the property has been made twenty years previously and had been maintained in line with the property. In this case the fire loss details were prepared from the records, found by field check to be correct and were accepted by the insurance adjustors, with the exception of a loss-of-earnings item which the insurance agent had inadvertently included with the property loss items.

Allowable Costs Under Government Contracts

by H. T. McANLY

Partner, Ernst & Ernst, Cleveland, Ohio

In this article[1] the author reviews the categories of costs allowable under the principles contained in the regulations governing renegotiation and under the more detailed provisions included in the applicable section of the procurement regulation of the armed services. He also relates these two sets of regulations to the types of contracts to which they have greatest relevance. The paper was prepared in the fall of 1950.

INTRODUCTION OF GOVERNMENT CONTRACTS into the operation of an industrial enterprise requires no changes in the application of well-established cost accounting principles used in the development of product cost and product net profit determination. Cost definitions applicable to government contracts can only set forth generally accepted bases for cost calculations. They merely represent guides which recognize, within the scope of cost accounting as it is practiced from day to day, the over-all conditions of doing business with the government. These conditions include cost differences incidental to quantities and character of products manufactured and incidental also to the sales of these products to a specific classification of customer, i.e. government departments.

What Cost Definitions Are for

Very properly, T.D. 5000, which covered cost definitions applicable to government contracts during the last war, was prefaced with the following wording, "No definitions of the elements of cost may be stated which are of invariable application to all contracts and sub-contracts". Hence definitions of cost, whether released in the past or to be released in the future, can only state in substance that those expenses are proper costs which, by reference to all the pertinent facts and circumstances, are reasonably related to the performance of the contract. By the same token, items of cost to be excluded in the proper determination of costs under government contracts, represent items not incidental to the production and marketing of specific products produced for the government. Cost definitions cannot remove the need for the exercise of sound judgment in the application of cost principles to existing operating conditions and the production of special or regular products for sales, directly or indirectly, to a governmental department.

It must be recognized that the various branches of the Defense Department and others government bodies with procurement powers, especially the Maritime Commission, represent a different type of customer for many of our industrial plants than their commercial outlets and may create extremely abnormal conditions. In particular the existence of an emergency demand for military needs may eliminate automatic controls provided by competitive pricing which would normally serve as a check rein to prevent recovery of unreasonable amounts of cost in sales or contract prices. Thus, cost definitions applicable to government contracts can, in addition to serving as media for sound costing, be expected to include an element of guidance as to measurement of amounts of expense which are considered as being reasonable.

A Word on Law and Policy

Before consideration is given here to the classifications of government contracts and allowable costs applicable to the respective types, mention of the various profit limiting acts, and mention also of other features of the government procurement picture, would seem to be appropriate. In addition to the Renegotiation Act of 1948, which has been applied to all military appropriation acts for the governmental fiscal years since June 30, 1948, there are the profit-limiting provisions of the Merchant Marine Act of 1936, the Vinson Act of 1934 and the Royalty Adjustment Act of 1942. Generally, the conflict of the Vinson Act with the Renegotiation Act of 1948 has been removed by the suspension of the former in connection with *negotiated* defense contracts for aircraft and naval vessels which are subject to the latter.

The future, of course, is not easy to discern. A new renegotiation bill has been introduced in Congress. It appears at this time to be concerned with definition of terms, with more detailed material on the factors to be considered in determining excessive profits, and with opening General Services Administration (see next paragraph) contracts to renegotiation. Should this bill be adopted, the renegotiation coverage of government contracts would not only be broadened but also would be applied to all governmental contracts, thus superseding the present limitation to *negotiated* procurement.

As to procurement procedure, the General Services Administration, established under the Federal Property and Administration Services Act of 1949, has replaced the Federal Bureau of Supply and services both civilian and military governmental agencies. This new agency has done much to coordinate procurement policies and procedures of the Departments of Commerce and Defense. The standard supply contract forms instituted, which have standard clauses

referring to applicable Federal statutes, were made mandatory for use on and after October 1, 1950.

A new policy governing military procurement was announced by the Department of Defense on August 30, 1950. It was stated that emphasis will be placed on types of contracts and contract pricing methods which encourage economy and production efficiency. Fixed-price contracts will be used without provisions for price redetermination or escalation whenever practicable. Incentive-type contracts, however, may be used where dollar amounts are large, production periods long, and reasonably close target prices can be established. Cost-reimbursement type contracts will be limited to instances in which other types of contracts are not suitable. These policy goals may be considered along with the Armed Services Procurement Regulation, which provides that it shall be the general practice for the fixed-price type of contract to be used for procurement by negotiation and shall be the only type used for procurement by formal advertisement or competitive bids.

According to the policy statement, prevention of "excessive profits" will be attempted through close forward pricing and repricing rather than through renegotiation in the case of contracts with price redetermination provisions. Although cost-plus-fixed-fee contracts and contracts with price adjustment provisions, are subject to renegotiation unless otherwise exempted, the prescribed separate consideration and special treatment of such contracts is not, at present, set forth in the military renegotiation regulations under which the 1948 Renegotiation Act is administered. Hence it is appropriate to say that, for fixed price contracts, we need to have special regard for the principles expressed in these regulations and for cost basis contracts special emphasis on the provisions of Section XV of the Armed Service Procurement Regulation is necessary, together with attention to the details of the contracts themselves.

FIXED PRICE CONTRACTS AND RENEGOTIATION

In connection with fixed-price contracts, renegotiation regulations state, in general, that the method of cost accounting established for determining net income for Federal income taxes will be permitted if that method reflects recognized accounting principles and practices. Otherwise, costs will be ascertained according to the method which, in the opinion of the government administering agency, will properly reflect them. By agreement with the assigned renegotiating agency, a contractor may adopt special accounting procedures on an annual basis, different from the method used in calculating income for Federal income tax

purposes. These special procedures may differ only to the extent of reporting particular identified items of cost as incurred in a fiscal year or years other than those designated for computing Federal taxes on income.

Border-Line Costs

Among the categories of perhaps doubtful items, the following are considered costs which are allowable but limited as indicated.

1. Reasonableness of salaries, wages and other compensation is subject to challenge according to the nature of the work, extent of responsibility, experience and effectiveness, and comparison with recent compensation record.
2. Brokers' commissions are not allowed except when payable to bona-fide commercial or selling agencies maintained by the contractor for the purpose of securing business. Such commissions must be equitably allocated between renegotiable and commercial business.
3. Employee pensions, annuities, stock bonuses or profit-sharing plans will be allocable where such payments have been determined by the Bureau of Internal Revenue to be deductible for Federal income tax purposes.

Sixty-month Amortization; Depreciation Charges

Amortization of defense production facilities will be allowable as cost to the extent allocable to government contract business. At this point, a measure of attention should be directed to the portion of the new Revenue Act of 1950, Section 124A, which provides for amortization of the cost of emergency facilities over a five-year period. This new law is applicable to any facility, land, building, machinery or equipment, or any part thereof, acquired or built for defense production and completed after December 31, 1949. Certificates of necessity like those issued under World War II procedures, will be issued under the new law.

No provision is made in Section 124A for shortening the five year period to cover a possibly reduced emergency period. However, items covered by the accelerated amortization provision can be removed from the classification at any time and subjected to normal depreciation rates, thus extending the over-all write-off period. In the event of sale of an asset covered by an amortization provision, the difference between the accrued amortization and what would have been the accrued depreciation is to be considered normal taxable income, thus limiting the capital gain calculation to the use of normal depreciation.

Depreciation of ordinary or usual production facilities which represent permanent capital additions for the manufacture of renegotiable products, will be allowed in renegotiation, to the extent applicable to government contracts, at the rates allowed under the internal revenue code. Depreciation of stand-by facilities which are customary and necessary to a particular type of business will be allocated between renegotiable and non-renegotiable business.

Conversion and Reconversion Costs

Cost of conversion of a contractor's plant to production of renegotiable business will be allowed in the year incurred, provided that such conversion does not cover items which should be capitalized and amortized or depreciated over a longer useful life. Generally costs in connection with the re-conversion of operations at the conclusion of renegotiable business are *not* allocable to government contracts. However, there are certain allowable costs which may occur when government contracts are discontinued, such as inventory losses, losses from sale, exchange or abandonment of facilities used in performance of renegotiable contracts, severance pay, depreciation and amortization, and general overhead expenses of a continuing nature for a reasonable period.

Costs of removing facilities used in government contract production, such as moving, dismantling, demolishment, protecting and storing such assets, will be allowed providing, of course, that no other use was made of the property during the period between completion of renegotiable contracts and the removal of facilities.

Selling and Advertising Expense

Selling expense will not be allocable unless it relates:

1. In major part to technical, consulting and other services used to adapt products to the requirements of the government and other contractors.
2. To the maintenance of offices or agencies servicing contract products.
3. To the sale of products or services which are of the type ordinarily sold and distributed through normal channels used by the contractor.
4. To brokerage commissions paid to bona-fide commercial agencies maintained to secure business.

As a general rule, advertising is not allocable to renegotiable business. However, where the contractor or subcontractor can demonstrate to the satisfaction of the renegotiating agency that renegotiable business was engaged in to the detriment of his normal commercial business, that portion of normal advertising expense which the government deems properly attributable to his effort to forestall loss of competitive position, shall be allocated to renegotiable business. Trade journal space is limited to advertising support to trade papers which are valuable for the dissemination of technical information.

In the case of subcontractors, normal product advertising expense may be allocated when the products sold under subcontracts are substantially the same as those sold in normal commerical business at a volume not in excess of normal commercial volume.

A "Quick-Over" of Other Costs

Other costs, such as losses incurred in connection with business ventures not related to government contracts, charitable and similar contributions, etc., are not allocable to renegotiable business. No deduction is allowable in renegotiation to cover net operating losses in prior years treated under the internal revenue code as a "carry-back" or "carry-forward" deduction.

State and local taxes on income are allowable to the extent allowable under the internal revenue code and to the extent allocable to the retained profit on renegotiable business. Patent royalties paid by a licensee will be allocable to renegotiable contracts. Royalties may be subject to challenge under the Royalty Adjustment Act.

In connection with replacement of base stock of a "lifo" inventory involuntarily liquidated, no adjustment of contract cost would be allowed because of any contemplated excess of replacement costs over base stock costs. However, consideration should be given in the final allowed profit margin to any apparent resultant inequities because of involuntary liquidation of inventories. Incidentally, the current revenue code does not contain any relief for the taxpayer whose basic inventory may be involuntarily liquidated. However, effort is being made to have the tax law amended so as to reinstate relief provision for involuntary liquidation of "lifo" inventories.

Where inventory valuation is significant as a cost element of renegotiable business, no profit determination will be made unless the renegotiating agency is satisfied as to the value of the inventory. A physical inventory taken within a reasonable time (ordinarily not in excess of 3 months) before the close of the fiscal period, may be acceptable. If necessary, the policy and review board may cause a physical inventory to be taken or may estimate the inventory valuation at the close of the fiscal year under review.

COST-BASIS CONTRACTS AND THE PROCUREMENT REGULATION

For simplicity, costs applicable to all cost-reimbursement type contracts and subcontracts are considered together. Included are cost-plus-a-fixed-fee contracts and incentive type contracts with periodic price redeterminations. Cost applicable to cost-basis contracts are set forth in considerable detail in the Armed Services Procurement Regulation. In general, these are classified into "direct" and "indirect" costs and allowability is tested by reasonableness, application of generally accepted accounting principles and practices, and limitations as to type as well as amount. Direct costs are considered to include materials and purchased parts,

direct labor, and other costs which are incurred in connection with individual contract performance. Indirect costs comprise manufacturing overhead expense, selling and distribution expense, and general administrative expense.

Direct Costs

Consideration should be given to the effect on material costs of reasonable overruns, spoilage and defective work. Withrawals from stock should be charged to material cost of product at prices consistently followed in the contractor's regular pricing procedure, provided the procedure is in accordance with sound accounting practice. In calculating material cost, all cash discounts, trade discounts, rebates and other allowances and credits, including credit for scrap sales arising from production of the contract, are to be considered. These may be applied directly to reduce material costs or may be apportioned as credits to indirect costs. Reasonable charges arising from physical inventory quantity shortages will be allowable in material cost, provided that the charges do not include unjustifiable "write-downs" and are related to the period of contract performance. Similarly, credits representing inventory overages will be applied to reduce material costs.

Direct labor cost is presented as consisting of salaries and wages, generally at actual individual rates paid, which are properly chargeable direct to contract performance. If it is the contractor's consistent accounting practice to calculate direct labor charges on the basis of average rates, the practice will be acceptable if demonstrated to the government that it is equitable in its results.

The use of normal or standard costs, with adjustments for variances from standard, is acceptable to calculate provisional or interim payments on cost-reimbursable contracts, but the procurement regulation states that the final allowable costs must represent actual costs less related income and other credits arising from operations under the contract. However, in arriving at the so-called final actual allowable costs, properly adjusted standard costs should be acceptable, especially if they are adequately supported and explained.

Indirect Costs

Allowable indirect costs are those concerned with the operating expenses of manufacturing departments, marketing of the contractor's products, and the general management, supervision and conduct of the business as a whole. These costs require equitable apportionment, with consideration given to any unusual circumstances involved in operations, such as changes in nature or volume of

ALLOWABLE MANUFACTURING OVERHEAD EXPENSES ENUMERATED IN THE ARMED SERVICES PROCUREMENT REGULATION

1. Depreciation, amortization and depletion upon cost of acquisition of machinery and equipment but excluding maintenance, depreciation, and other costs incidental to excess facilities, other than reasonable standby facilities.
2. Freight, transportation inbound and material handling.
3. Jigs, dies, fixtures, patterns, drawings and special tools.
4. Manufacturing and production engineering as distinguished from research, experimentation and development.
5. Overtime compensation for direct or indirect labor, *to the extent expressly provided* elsewhere in the contract or otherwise authorized by the government. If provision has not been made for overtime premiums, they are construed to be eliminated, and the overhead rates developed for use in government contract costing should be based upon a production activity that does not include a work period that calls for overtime operations. Thus, if government contracts are worked on during a production period which calls for overtime, such as a 48-hour work week, the provision for all fixed expenses in the overhead rates should be related to a shorter work period (possibly 40 hours which calls for no overtime). Generally this should give the contractor a higher overhead rate to use on government contracts (in which overtime premium has been excluded) than overhead rates containing a provision for overtime premium but based upon a higher activity.
6. Salaries and wages, direct and indirect, with consideration given to the relationship of total compensaton to the services rendered. The amount allowed may be limited.
7. Real estate and personal property taxes.
8. Patents, purchased designs, and royalty payments, to the extent expressly provided for in the contract or otherwise authorized by the government.
9. Recruiting (including "help wanted" advertising) and training of personnel; improvement of working conditions, employer-employee relations, and standards of performance.
10. Research and development specifically applicable to the supplies or services covered by the contract.
11. Vacation, holiday and severance pay, sick leave and military leave, to the extent required by law, union agreement, or employer's policy.

EXHIBIT 1

production, etc. Examples of indirect costs (which may be treated, in some instances as direct) are cited in Exhibits 1, 2 and 3. They are allowable within limitations indicated there.

Under examples of *unallowable* selling costs in the procurement regulation, attention is particularly directed to expenses such as entertainment, selling and distribution activities not related to the contract products, and commissions and bonuses (under whatever name) in connection with obtaining or negotiating for a government contract. The treatment here appears to be in conflict with the allowance of bona-fide brokerage commissions in the renegotiation regulations and the procurement regulations will probably be interpreted to coincide with the more liberal renegotiation regulations.

ALLOWABLE SELLING AND DISTRIBUTION EXPENSES ENUMERATED IN THE ARMED SERVICES PROCUREMENT REGULATION

1. Advertising in trade and technical journals, provided it offers financial support to journals valuable for dissemination of technical information within the contractor's industry.
2. Reasonable traveling expenses.
3. Salaries and wages, limited as to relationship of total compensation to the services rendered.

EXHIBIT 2

Exceptional or Special Costs

In addition to the foregoing examples there are items of costs allowable under cost-basis contracts, which may require special consideration with the negotiation or performance of this type of contract. It is important to contractors as well as to contracting officers that express provision be made for these costs by incorporating appropriate clauses in the terms of particular contracts. According to the procurement regulation "action taken with respect to any such subject shall be reflected either in the contract or in the record of contract negotiations."

ALLOWABLE GENERAL AND ADMINISTRATIVE EXPENSES ENUMERATED IN THE ARMED SERVICES PROCUREMENT REGULATION

1. Compensation of corporate officers, executives and department heads, including salaries, royalties, license fees, bonuses, and pension, retirement, and deferred compensation benefits. The total compensation of an individual may be questioned and the amount limited. Consideration will be given to the relationship of total compensation to services rendered.
2. Directors' and executive committee fees and expenses, the expense of stockholders' meetings, annual reports, reports and returns prepared for governmental authorities.
3. Bonds and insurance, including self-insurance but excluding premiums for insurance on lives of directors, officers, etc., where the contractor is the beneficiary, directly or indirectly.
4. Legal, accounting and consulting services and related expenses, *except* expense incurred for organization or reorganization, prosecution of patent infringement litigation, defense of antitrust suits, and the prosecution of claims against the United States.
5. Memberships in trade, business and professional organizations.
6. Miscellaneous office and administration services and supplies, including communication expenses.
7. Pension, retirement, group health, accident, and life insurance plans with employees as the beneficiaries.
8. Salaries and wages limited as to relationship of total compensation to services rendered to the contract performance.

EXHIBIT 3

Some of the more significant costs which may require special consideration of this sort are:

1. Cost incurred prior to contract performance, with specific identification of the types which are incidental to work covered by the contract.
2. Overtime compensation.
3. Personnel movement of a special or mass nature.
4. Re-arrangement or re-location of facilities or plant sites.
5. Special tooling and equipment.
6. Research programs of a general nature.
7. Patents, purchased designs, and royalty payments.
8. Use of rental charge as compensation for plant facilities fully depreciated or amortized, or acquired without cost.
9. Items generally classified as manufacturing overhead expense which may be chargeable as direct costs to contract performance. For example, where it can be demonstrated that costs are specifically related to the contract, such as inspection, material handling, freight-in, etc., these costs should be charged direct rather than through allocation with other indirect items.

INDIRECT COSTS UNDER VINSON AND MERCHANT MARINE ACTS

Under Vinson Act applications, allowable factory indirect expenses are ordinarily to be distributed to the cost of the contract or subcontract on the basis of the proportion that contract direct labor bears to the total direct productive *labor during the period within which the contract or subcontract* is performed. However, the applicable regulations state that consideration is to be given to the circumstances in instances in which indirect factory expenses are incurred in different proportions by the various producing departments. In the case of general and administrative expenses, the basis of distribution specified is the proportion that individual contract manufacturing, installation and construction cost bears to the similar total for all contracts. For bidding expenses, general selling and general servicing expenses, the bases ordinarily used are either sales or cost of sales. Again, the regulations state that special consideration is to be given to the relationship which certain classes of such expenses bear to the various classes of articles produced in each case.

Under the Merchant Marine Act, the cost categories of overtime, production bonuses, premiums and other labor incentive payments to direct labor employees are required to be included as direct labor. The regulations provide for distribution of overhead, consisting of all charges not directly allocated to particular contracts, by methods which must conform to sound accounting practice and must be so demonstrated to the satisfaction of the U. S. Maritime Commission. Where more than one class of work is performed, no class of work should bear an appreciable amount of indirect expense which should be properly applicable to another class.

The distribution of overhead equally over all or substantially all productive labor performed by the contractor will not ordinarily be acceptable, unless it is

demonstrated to the Commission that the method results in a substantially accurate cost determination. Therefore, separate departmental rates for overhead distribution applicable to the corresponding direct labor charges may be necessary.

Where distribution of various classes of factory overhead expense on bases other than direct labor can be demonstrated as substantially equitable, these bases may be permitted. They could include the following:

1. Machine-hour rates.
2. Standard or specification manufacturing cost rates.
3. Differential distribution to various classes of work as, for example, various fixed percentages determined by periodic cost and engineering surveys, applied to each class of work. When predetermined rates or other methods are in use, the under or overabsorbed amounts of the actual total of all indirect charges must be distributed currently and with substantial accuracy to provide complete distribution of period expenses.
4. Equalizing of seasonal expenses, as heating expense, is permissible.

Under Vinson and Merchant Marine Act contracts, the accounting periods may differ from the fiscal period used for Federal taxes on income, because these acts cover the individual contracts completed during the income-taxable year. Aggregate of sales made during the income-taxable year, whether or not on completed contracts, is the basis for cost determination of renegotiable business. Cost-basis contracts, however, cover varying periods of contract performance for cost reimbursement, price redeterminations, etc.

INDIRECT COSTS—IN GENERAL

Indirect costs include factory indirect expenses and general administrative and selling expenses. Allocation of indirect factory expenses, such as general factory administration, pre-requisite productive (tool and pattern), service departments (maintenance, heat and power), etc., should be accomplished in relation to services rendered the productive departments or production centers if the development of more than an over-all factory burden rate is necessary to properly reflect cost. Certain of these general indirect factory expenses, which cannot practically be measured on a service rendered basis, should be allocated in relation to productive hours, productive labor dollars, or total productive labor plus direct expenses, using the basis which appears to be the most equitable when consistently applied.

Administrative and Fixed Selling Expenses Pose Problem

The development of an equitable basis for the absorption of administrative and fixed general selling expenses into product cost, is an ever-present problem. Regulations issued to date have not solved this problem when the use of total

factory cost is suggested as the basis for distribution. Total cost including materials appears to be equitable only if all products contain about the same relative amount of material in relation to total cost.

It is probable that general administrative expenses would be more equitably distributed on the basis of a product unit than on total factory cost. However, with a wide variation in the character of the products, a weighting factor must be considered, such as the relative time of plant capacity consumed in the manufacture of each product. For example, if one item consumes twice the plant capacity required for another, it should bear twice the general fixed administrative cost. If direct labor required in manufacture represents a reasonable measure of relative time of plant capacity consumed, direct labor cost would appear as a generally equitable base. In this connection, if a bottleneck process exists through which all products pass, the relative time in this process could serve as a proper product unit weighing factor.

It should be recognized that, under certain conditions, direct labor does not represent a relative measure of plant capacity consumed. For example, where certain contract products are made on highly automatic equipment requiring a minimum of direct labor and other products are made on individually-operated machines, the use of direct labor as a basis would distort the distribution, since it would not represent a measure of relative productive plant capacity consumed. Therefore, productive machine or processing time is a more reliable weighting factor.

When regular products are manufactured for both defense and commercial purposes, the application of sound and established cost principles which vary the manufacturing cost to properly cover the quantities produced, provide for equitable allocation of product development and general administrative costs, and relate incurred selling cost to type of customer, should be recognized as affording an acceptable measure of contract cost and profit margin.

TWO PRINCIPAL SOURCES OF CONTRACT COST REGULATION

Regulations covering allowable costs under government contracts fall into two general classifications: those which apply to fixed-price type contracts and those which are applicable to the cost-basis type (cost plus fixed fee, incentive, price redetermination, etc.). Under present Federal statutes, negotiable fixed-price contracts and subcontracts thereunder are subject to recapture of "excessive profits" as determined either by the Department of Defense (under renegotiation or the Vinson Act) or by the U. S. Maritime Commission (under the Merchant Marine Act). Cost basis contracts also may be subject to renegotiation. How-

ever, the aim of allowable costs and cost exclusions as defined in the Armed Service Procurement Regulation, is to limit costs rather than recapture profits. For this reason, a considerable number of cost definitions are available in regulations governing cost-basis contracts. In contrast, the renegotiation regulations place more emphasis on cost principles in renegotiation to eliminate excessive profits.

Cost definitions as released to cover government contract cost determination, merely set forth definitions of elements of cost which coincide with those recognized as sound for the cost of any product. The items excluded merely represent items which are not incident to the production and marketing of an item sold to a single customer whose sound credit is unquestionable, who requires but little direct selling effort, and who stipulates that all recoverable cost must be reasonable, since the element of competition which normally prevents recovery of unreasonable cost, generally does not exist in an emergency period.

SHADOW OF EVENTS

IT SEEMS INCONCEIVABLE that businessmen can believe that they do not engage in forecasting every day of their lives. Yet some reject completely the thought of forecasting. However, every decision made in business or in personal affairs is based on a forecast as to its effect on the business, ourselves, or our families and associates.

In business not a machine tool would operate (nor, in fact, would a machine exist), had not someone made a forecast. The recorded history found in the accounts of any company, forms the tangible evidence of a series of forecasts dating back to the day that the enterprise assumed shape in the minds of its founders.

Of course, it is the formal forecast which is belittled. One can sympathize with this, for a bad guess can come back to haunt the person who made it. However, the satisfaction to the forecaster and, even better, the profit to the enterprise which results from a good "guess," will make up many times over for the disappointment of the poor ones. This statement is based on the assumption that, in making the guess formal, the time and effort necessary to make it a considered one is also applied.

JOHN O. NICKLIS, *Greenwich-Stamford*

BETTER SHOP AROUND

THE COST ACCOUNTING DEPARTMENT may be doing the company a disservice if it is putting all-out emphasis on low material and supply costs. In these times, a purchasing department must have more than one source of supply.

If the best terms can be had by placing all orders with one supplier and if it is the policy of the company to buy from this source year after year, the concern stands to be very badly hurt. The servicing supplier may have difficulty getting crude materials and, for that reason, may not be able to meet demands. If that happens, it is pretty late for the customer to look around for a new source of supply. With the likelihood that defense orders will disrupt supplies at many points in civilian production, the matter is of considerable moment.

Hence, it would be well for a company to have several sources of supply—even at a greater cost for materials—located in different sections of the nation. Floods, strikes, storms, interference by wars (even though not our own) are thus less likely to have disastrous impact. Numerous examples of the hazard could be cited. For one, if a rug manufacturer using special wools produced in Red China does not now have another source of supply, he may be in a very bad way indeed.

Even large companies get "tied up" with government contracts and vanish as sources of supply for the run-of-the-mill buyer. The necessity of maintaining business relations with small suppliers and distributors is, therefore, one practical course. Laid-down cost of materials and supplies cannot be safely over-emphasized. Supply sources, even at higher costs, must be kept open.

A. B. PETERSCHMIDT, *Portland*

POINTS

ANYBODY LISTENING?

ORDINARILY, IT SEEMS TO ME, there are too many accounts, too many entries, too much posting, too many errors, too little analytical thinking and too much detail included in too many accounting presentations to executives. Rather, the whole cost accounting procedure should be aimed at definite informational goals. It makes no sense to prepare reports and statements which nobody will use ever. Good ques-

tions to ask (oneself) before preparing cost reports are:

1. Who will read and study the results?
2. Is the presentation readily understandable?
3. To what type of executive are the reports addressed?
   a. The figure man who wants all the data in detail dollars and cents and in narrative form?
   b. The ratio man who craves little dollar detail but understands percentages, ratios and index numbers?
   c. The engineer or chart man who desires none of the figures or ratios but likes graphic portrayal so that he can quickly determine relative values and trends?

There is no point in presenting information which is not geared to its audience. If this audience comprises all of above types of individuals, the plan of reporting must reflect diversification. Talk the language!

DONALD P. SWEETSER, *New York*

COMPOUND OVERHEAD

THE ARTICLE, "Why should we allocate Overhead?", in the September "Workshop," is one of the most thought-provoking and realistic which has appeared in any recent publication. The author's arguments make sense and the reader unconsciously begins to review his own cost system and apply the test of realism to his own burden allocations.

If we are going to keep the science of cost accounting a dynamic tool of management, we must be thoroughly realistic in our application of its principles, and nowhere must we be more realistic than in the field of burden allocations. The time and effort now consumed by many accounting staffs in prorating and distributing burden items can be better employed in presenting and "'selling" information on controllable costs to tthe persons in management who are in positions to act upon it. This is a field which is full of promise.

HAROLD F. COURTRIGHT, *Omaha*

PROGRESSIVE COSTS

"WHY SHOULD I be charged with that?" This is an increasingly common complaint heard from budget and cost-minded foremen and department heads.

Cases in point are numerous. Three will suffice here. A tool engineer decides what tools a department will use. Should the department stand the expense if the usage is excessive due to soft tools or breakage? A layout expert changes positions of machines for better grouping and increased production. Should the department be charged with added material handling or trucking due to the change? A machine designer creates for his plant a machine which will successfully perform an operation on the product. Who should be charged if there is a resultant increase in inspection cost on the finished part?

Examples like the above point to the need of an expense account carrying the title of "management or engineering decisions." This account could be charged with all the extraordinary expenses of an undertaking which were not anticipated during the experimental or trial stage. It could be charged for costs indirectly incurred as a result of management decisions and policies as related to production, inventories, personnel, obsolescence, etc. The amount charged to this account would be considered as an acceptable cost to the degree to which the actions reflected resulted in greater stability to the organization or greater profit return from the products.

F. J. WAGNER, *Muskegon*

Renegotiation — The Present Picture

by JOHN N. COLE

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Renegotiation, re-instituted in a limited way in 1948, has had relatively little impact on industry as a whole. It is apparent that this impact may soon be more widely felt because of increased military procurement and possibly also because of additional legislation. The present author outlines the current scope of renegotiation, some of its requirements, and proposed extension of it.

THERE IS UNDOUBTEDLY a good deal of uncertainty in the minds of business men with regard to contract renegotiation because of the unsettled state of the legislation dealing with the subject. In brief, the pattern of the renegotiation legislation from 1948 to date has been that the Renegotiation Act of 1948, which originally applied only to contracts entered into pursuant to a single appropriations act, has been made applicable to military procurement contracts entered into under subsequent appropriations acts. The general appropriations act for 1951, is the most recent inclusion.

Boundaries of Renegotiation

Certain other changes have likewise been made since the law was passed in 1948. The most important of these were included in the Military Appropriations Act of 1950, which limited renegotiation to *negotiated* contracts and made the already existing Vinson-Trammell Act inapplicable to contracts subject to renegotiation. Both of these provisions are continued under the legislation controlling 1951 business.

There are two limitations defining the area of renegotiable business, in addition to the limitation to negotiated contracts. These are: (1) that contracts and subcontracts of $1,000 or less are not renegotiable and (2) that the receipts and accruals from renegotiable business of a particular seller during his fiscal year will not be renegotiated unless they amount to at least $100,000.

In determining whether or not the seller has had receipts and accruals amounting to $100,000 or more, all orders for $1,000 or less are excluded. So long as each order for $1,000 or less is in fact a bona fide individual order, it does not matter that a number of these orders are for items to be incorporated in the same end product. On the other hand, if there is an over-all or master contract between a contractor or a subcontractor and his customer, against which the customer can issue a requisition or an order to ship a portion of the items at one

time, it is the over-all contract which must be examined to determine whether the business is subject to renegotiation and not the separate orders against it.

Identification of Contracts as "Negotiated"

In further consideration of the distinction between negotiated and competitive contracts, it should be noted that this is significant only as related to the prime contract. If a prime contract is negotiated and is otherwise subject to renegotiation, subcontracts under it amounting to more than $1,000 are renegotiable, regardless of how they are entered into. Conversely, no subcontracts under a prime contract let by competitive bidding are subject to renegotiation.

In practice, it is sometimes difficult to determine whether a prime contract was negotiated or let through competitive bidding. The renegotiation regulations define "negotiated contracts" as contracts exempted from advertising required by the Armed Services Procurement Act of 1947. The question is, therefore, whether there has been such formal advertising with reference to the particular contract. The terms of contract, itself, sometimes settle this point specifically. For example, the first page of the contract form may state, "This contract advertised under authority of act of February 19, 1948 (Public Law 413, 8th Congress)". Also the words "negotiated contract" may appear on the contract form where such is the case.

Further Aids to Determining Renegotiable Business

Although the law requires that a renegotiable prime contract and the subcontracts thereunder carry notice that they are subject to renegotiation, it is not safe for subcontractors to rely upon the presence or absence of such notice. In renegotiating, the government is taking steps to make sure that all renegotiable business is included, even if this notice has not been given.

A seller is also aided in segregating renegotiable contracts and subcontracts by lists of renegotiable prime contracts which show the name of the prime contractor and contract number. (The service of supplying these lists of prime contracts, together with the Military Renegotiation Regulations and amendments thereto, is available at the office of the Superintendent of Documents, Washington 25, D.C.) Additional lists of such contracts, nuremical rather than alphabetical, may also be obtained. However, as in the case of inclusion of notice of renegotiability in the contract itself, the government takes the position that such lists cannot be relied upon as being complete.

Experience on the part of some manufacturers in checking orders bearing the renegotiation article against the list of renegotiable prime contracts issued by the

government, indicates that some purchasers have included the renegotiation article on orders which are not subject to renegotiation. It is easy to understand that this might happen. For this reason, it is important for sellers to use the list available from the Superintendent of Documents rather than rely wholly upon the presence or absence of the renegotiation article in particular orders.

Sundry Exemptions, "Shelf Goods"

The renegotiation legislation lists various exemptions not all of which are of interest to manufacturers in general. Similar ones were included in the wartime Renegotiation Act of 1944.

They consist of the following:

1. Contracts between governmental agencies.
2. Contracts and subcontracts for certain raw materials.
3. Contracts and subcontracts for certain agricultural commodities.
4. Contracts and subcontracts with certain tax-exempt institutions.
5. Construction contracts awarded as a result of competitive bidding (previously mentioned).
6. Subcontracts under exempt contracts and subcontracts.

The regulations issued by the Military Renegotiation Policy and Review Board provide for still other exemptions. One of these is the exemption of so-called collateral items, meaning articles used in the processing of an end-product or a part going into an end-product but not themselves going into the end-product or part. Such items as machine tools and handling equipment, and parts thereof, were exempted by this action of the board.

Since the beginning of peace-time renegotiation, industry has been critical of its application to items purchased for stock and known as "shelf goods", on the ground that because of the uniformity of such items, standardized production methods, well-established costs and general keen competition, renegotiation is not required to keep profits within a reasonable range.

The renegotiation board in April of last year gave recognition to the special circumstances relating to the production and marketing of stock items but in a circumscribed way. By amendment to the regulations the board exempted

> "all subcontracts which are for items customarily purchased for stock in the normal course of the purchaser's business, *except when such items are especially purchased for use in performing a contract or higher tier subcontract subject to the Renegotiation Act of 1948.*" (Italics supplied.)

Exemption of Renegotiable Contracts from the Vinson-Trammel Act

Brief mention has already been made of the Vinson-Trammell Act. This applies only to naval vessels, naval and army aircraft, and parts thereof. Only

contracts amounting to at least $10,000 have been subject to this act. Whereas the extent of profit limitation under renegotiation is an individual matter, the legislation providing a number of considerations which govern the amount of allowable profit, the Vinson-Trammell Act specifies the profit limitations for subject contracts as 12 per cent for aircraft and parts and 10 per cent for naval vessels and parts.

As has been stated, the scope of the Vinson-Trammell Act has been narrowed by exempting therefrom contracts and subcontracts subject to renegotiation. However, there has been left under the Vinson-Trammell Act a residue of military contracts not brought under renegotiation. For example, it has been pointed out here that only *negotiated* contracts are now subject to renegotiation. Some idea of recent methods of purchasing by the services can be gained from the fact that in 1949 the air force *negotiated* 92 per cent of its purchase orders, the navy 64 per cent and the army 54 per cent.

The exemption of contracts and subcontracts subject to renegotiation from application of the Vinson-Trammell Act is provided for in the following language in the General Appropriation Act of 1951:

> "Notwithstanding any agreement to the contrary, the profit limitation provisions of the Act of March 27, 1934 (48 Stat. 503, 505, the Vinson-Trammell Act) as amended and supplemented, shall not apply to any contract or subcontract which is subject to the Renegotiation Act of 1948."

This provision has given rise to several questions of interpretation as to which the author has sought and received rulings from the Treasury Department, which administers the Vinson-Trammell Act. One question raised by the provision quoted above was whether contracts and subcontracts, renegotiable except for the fact that the contractors' receipts and accruals from them would not amount to $100,000 during the year, remained exempt from the earlier act. The Treasury Department's answer to this question was that contracts and subcontracts, are exempt from the application of the Vinson-Trammell Act, if they are renegotiable apart from the question of the volume of a contractors' renegotiable business. The consequence of this ruling is that some government contractors may be in the favorable position of being subject to neither the Vinson-Trammell Act nor renegotiation, being free of the former because their military contracts are "subject to" renegotiation and being free of renegotiation because the total amount of receipts and accruals from renegotiable business during the fiscal year is less than $100,000.

It may be mentioned here that the two acts have different incidence on the business to which they apply. Contract renegotiation relates to receipts or accru-

als under renegotiable contracts during the fiscal year, whereas the Vinson-Trammell Act relates to the total price for all subject contracts completed during the income taxable year. Hence receipts or accruals under a single contract may be renegotiated successively over a period of two or more years while a contract will be dealt with only once for Vinson Act purposes, i.e. upon completion.

Upon completion of a contract subject to the Vinson Act, a report to the procuring armed service is required and annual reports relating to all covered contracts or subcontracts completed within the income-taxable year are required on or before the fifteenth day of the ninth month following the close of the income-taxable year. The Standard Form of Contractors' Report relating to contract renegotiation must be filed by the end of the fifth month after the fiscal year has closed.

Proposed Legislation Broadening Renegotiation

Representative Vinson has introduced in Congress a sweeping statute based in large measure upon the wartime Renegotiation Act of 1944 and in some respects more thoroughgoing. Adoption of legislation stemming from this bill would impose a new set of rules upon business. However, some of them would duplicate controls under which business has been operating. In case of any such revision, renegotiation would continue under the provisions now in effect, as to contracts and subcontracts under which amounts had been received or accrued prior to the effective date of the new legislation.

Some of the most important provisions of the proposed bill are:

1. All contracts for procurement by the military service department (army, navy and air force) and the general services administration, and subcontracts thereunder, would be subject to renegotiation. There would be no exclusion of orders for $1,000 or less, nor of contracts let competitively.
2. The bill contains no mandatory exemptions other than the exemption of contracts by a department of the government with any agency of the government or with any territory, possession or state and the exemption of contracts for an agricultural commodity in its raw or natural state.

Practical Determination of Excess Profits

by CHARLES H. PORTER

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At press date of this issue, there has been placed on the statute books an excess profits tax measure adopted under the pressure of the developing international situation. With the thought that this enactment will not end discussions as to the "how" of excess profit taxation, the present article, in which the author proposes a payroll to earnings base as a profits measure, is offered for its contribution to the subject.

THERE IS NO PERFECT FORMULA for determining excess profits. If however we are to have an excess profits tax we must strive to devise a formula which will not confuse profits due to superior efficiency or due to added investment with profits due to war, for the excess profits which we are seeking to identify for tax purposes, are the extra profits made by a company as a result of war mobilization over and above the profits that company would have made in a world at peace.

That identification is even more difficult to make now than it has been in the past. Since the end of World War II, corporations have spent hundreds of millions of dollars in expanding and modernizing plant. Much of this plant has been completed so recently that it has been producing for only a fraction of the post-war years, and some of it is not even now in production. These millions of dollars of added investment would be earning profits in 1951—much of it for the first time and still more of it for the first time on an established basis—even if there were no war or mobilization for war. It is also true that greater pre-tax profits in 1951 than in immediately preceding years will, nevertheless, often represent smaller earnings than would have been made in a civilian economy, due to the effect of military demand on supply and markets.

What the increased earnings should be is a question which does not lend itself to ready answer. The normal rate of return on added investment differs between industries. The determination of an invested capital base and the adjustment of it for change, involving the effective date of change as well as the amount of change, are difficult. The old excess profits tax with its alternative earnings and invested capital bases, resulted in many claims for adjustments and refunds. Some of these are not yet settled. How many of the settlements were inequitable is a matter of opinion. The settlement negotiations consumed an enormous

amount of time and energy of employees of the Bureau of Internal Revenue and of the executives of the corporations involved.

Developing a Peace-time Profits Ratio

We need, therefore, an excess profits formula which, in comparing the 1951 profits of each company with its profits in a base period, makes proper allowance for the expansion of the company and does not require a determination of the dollars of invested capital. Labor suggests itself as a possible factor. Certainly, in any company, the relationship between its utilization of labor and its earnings should express what is normal with respect to the latter. Although there are objections to this basis, which will be mentioned further on, it is broadly sound and appropriate to thce present situation. Hence the following formula is offered:

1. Determine the pre-tax net income for the entire base period, subtract all interest and dividends included in net income, add all interest included in expense and the total of individual salary payments in excess of $3,000 per annum, i.e., the difference between total payroll and social security payroll. (Whether to use $3,600 in line with the social security law applicable to 1951 or to use $3,000 for formula purposes throughout, is a matter of detail.)
2. Determine the total social security payroll for the entire base period, i.e., the total payroll less individual salaries in excess of $3,000 per annum.
3. Compute the normal peace-time profit ratio for the company by dividing the first amount above by the second amount.
4. Apply the ratio to the social security payroll for 1951 (or other excess profit tax year) to determine the dollars of normal pre-tax profit of the company. Actual profits (adjusted by interest, dividends, etc., as for the base period) in excess of this amount are the excess profits which we are seeking to identify for tax purposes.

Advantages of the Plan

Although some alternative method should be authorized for companies having losses or subnormal profits in the base period, e.g., Waltham Watch Co., and although the suggested formula would be inapplicable to banks, insurance companies, and other financial institutions and personal service companies, its merits are outstanding. The underlying assumption on which the proposed formula is based is that, for any one company, the number of employees and its payroll will increase in proportion to increase in capital invested in plant and that the volume of business and of profits will vary with the number of employees. There will, of course, be a substantial difference between good and bad years but, whatever formula is used, an average of results over a base period is a necessity as a yardstick. For a particular company, the ratio of profits to payroll is more nearly constant than any other easily determined ratio. The following points are demonstrative of the serviceability of the formula:

1. The excess profits of a company are determined through a comparison with its previous profits.
2. Because both interest expense and interest income are excluded, no adjustment need be made because of substitution of stock for bonds or for convertible debentures or because of other changes in sources of capital.
3. Because the date when additional capital invested in plant begins to earn a return coincides with the date when additional employees are needed to operate such plant, these profits will not be confused with additional profits earned on old plant because of the war.
4. Since the purchasing power of payroll dollars, inventory dollars, and dollars invested in receivables are at all times on the same level, increased payroll for the the same number of employees will parallel the needed increase in capital invested in inventories, etc.
5. The ups and downs of the social security payroll more nearly parallel the ups and downs in business activity and profits than do the ups and downs of the total payroll, because many executives receive the same salary in good times and bad. Moreover, the use of social security payroll rather than gross payroll will deter a company from increasing the salaries of executives on the theory that the Government will "pay" 75 per cent of the increase.
6. Use of the formula avoids the assumption that the normal rate of return on additional invested capital is the same for all industries. Return varies, of course, with the risk factor and whether the industry is stable or highly cyclical in character.
7. The use only of amounts already definitely a matter of record will greatly simplify the determination of excess profits both for the corporation and for the Bureau of Internal Revenue.
8. In the former excess profits tax, the effort to give some protection to companies expanding normally, allowed an invested capital base which actually gave a "free ride" to companies which were slipping, which had large unused capacity, and whose increased profits were due entirely to the war. Since the profits-to-payroll ratio adequately protects companies expanding normally, the alternative tax based on invested capital can fairly be made stiffer than before and would recapture true excess profits.

Two Points to Consider

One disadvantage of use of the proposed formula is that companies which have greatly increased the degree of mechanization in their operations, thereby increasing their invested capital while reducing their payroll, would be penalized, e.g., some coal companies. Such companies could use the alternative method (whatever is adopted) available to companies with subnormal prewar profits.

Companies with unused capacity in the base period would appear to be in for a "free ride." However, in work on military orders, prices and profits are subject to renegotiation. Whether the government recovers excess cost to it through excess profits tax or through renegotiation is immaterial. Because of the burden of unused plant, the pre-tax profits of most such companies in the base period would have been small and therefore the profit-to-payroll ratio would also have been small.

A Better Measure

Interest and dividends received are properly excluded from application of excess profits, except for financial institutions to which this suggested formula is not applicable. Interest is usually that received on government bonds and, in

any case, is such a small percentage of the capital invested in interest-bearing bonds or notes that it cannot be considered excessive. Dividends received are paid from the residual income of other corporations which have already paid a tax on excess profits, if any, and have paid all other taxes. The transfer of these already taxed profits as dividends to a second corporation does not make them profits due to the war and therefore excessive.

In my opinion, the profit-to-payroll ratio is preferable to a profit-to-sales ratio because a company operating at capacity can greatly increase its sales volume by subcontracting. Increased profits to the prime contractor resulting from wartime subcontracting are certainly due to war and should not be exempted from an excess profit tax.

Hence, as said at the start, we have in the relationship of a company's outlay for labor a practically sound measure of profit return. Let us use this measure in the present to avoid the inequities of excess profits taxation methods which have been followed in the past.

Editor's Note: Professor Porter desires that attention be called to the existence of a similar proposal, differing only in detail and advocating a profits-to-payroll formula as a base for excess profits determination, made by James F. Stiles, Jr., Vice-President and Treasurer of Abbott Laboratories, Chicago, Ill. Mr. Stiles' proposal had not come to the notice of the author at the time the present article was written.

On-The-Job Training After Two Years

by CALVIN A. VOBROUCEK

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At least the first stages of the test of time have been passed successfully by the accounting training program in operation at Caterpillar Tractor Company. In the present paper one of its alumni gives pertinent information on the results of the program, primarily as seen through the eyes of participants.

WHETHER THE BEST METHOD of acquiring a working knowledge of techniques by which the detailed problems of a particular business organization are met is through the formal training route or through the slower method of absorption and association, are questions on which there has been no unanimity of opinion. However, industry has learned from its apprentice programs that the time spent in learning by absorption and association can be materially shortened by auxiliary or supplemental formal training. Accordingly, Caterpillar Tractor Co., which has for years sponsored many factory training programs (including a training program for engineering graduates), in 1948 extended its scope to present a one year college graduate accounting training program. The particulars of this program were presented by Mr. Robert A. Morgan, Manager, Office Methods and Procedures Division, Caterpillar Tractor Co., in his article "Meeting Management's Need for Men Trained in Industrial Accounting" which appeared in the *N. A. C. A. Bulletin* for June 1, 1948.

History of the Experiment

Since the inauguration of the college graduate accounting training program at Caterpillar, hundreds of university graduates have been interviewed. From these have been selected the approximately fifty young men who have undergone training by the company. The first class, which began on August 16, 1948, consisted of sixteen men from eight schools. These men completed the one-year training program in July 1949 and are currently assigned within the accounting, parts, purchasing, and treasury departments of the company. The second class of fourteen trainees representing eleven schools began work in August 1949. These men completed the program in July 1950 and are now assigned within the accounting and treasury departments of the company. They

represent accounting graduates selected as the result of interviews conducted at fourteen universities.

In planning a college graduate accounting training program, the company felt that, by rotating a trainee in various jobs, he could be given more and broader views of the company's and departments' activities than would be possible if, as a new employee, he were assigned to one job with no certain prospect of change. For both groups which have had the full course, classroom sessions, in conjunction with the rotating basis of "on-the-job" training, were scheduled to present and explain theories and underlying systems and methods and to provide a discussion place where trainees and supervisors could exchange ideas about any phase of related activities.

The Training Stations and Substations

All trainees attended classroom sessions together, but the group was divided for the on-the-job training. This was required so that trainees could be assigned at the same time to training stations where actual work experience could be obtained. Listed below are the training stations to which trainees of the second class were assigned and the number of weeks spent at each:

No. of weeks	Training station
Factory accounting division	8
Timekeeping section	
Performance report section	
Cost accounting division	7
Prime products cost section	
Detail cost section	
Material cost section	
Estimating section	
General accounting division	9
Expense analysis section	
Accounting distribution section	
Property accounting section	
Internal auditing division	9
Intermittent audit section	
Disbursements audit section	
Revenue audit section	
Payroll audit section	
Tabulating division	3
Machine room	
Records section	
Office methods and procedure division	8
Forms control section	
Methods section	
Payroll division	3
Machine room	
Clerical section	
Accounts payable division	3
	50
Vacation	2
Total	52

As each trainee completed his time at a training station, he submitted a written report covering his own work and the work of the particular division as he saw it. These reports were reviewed by the training and accounting department supervisors and later discussed with the individual trainees.

The classroom schedule followed by the second class of trainees included approximately fifteen sessions or twenty-three hours of talks by department heads before the combined engineering and accounting training groups. Details of the operation of the factory accounting, cost, tabulating, payroll, tax, general accounting, and internal auditing divisions occupied fifty-five sessions of two hours each. Sessions were also devoted to company organization, machine tool types and uses, production control, industrial economics, effective speaking, and working with others. An entire week was spent by the group in learning something about company products. This phase of the program was under the guidance of the company's sales training division and included movies, discussions, plant tours, etc.

The Students Survey The Program

A canvass of the participants in this second year (1949-50) of the college graduated accounting training program was conducted by two members of the group with the approval of the company for the purpose of evaluating the training program in general and to bring to light suggestions for its improvement. In connection with this survey, there are two things to bear in mind. First, it was not an attempt to rate individual supervisors or employees but rather an endeavor to form an opinion as to the value of the training received throughout the training stations and series of classroom meetings. To this end, each man was cautioned when completing the survey form, to set aside the question of personalities and grievances (if any) and to answer the questions fairly and objectively. Second, the results of the survey could be indicative only, since many changes in personnel, methods, and physical arrangements were made during the course of training of this group. Nevertheless, it was hoped that some indication of the successes or weak spots of the program as a whole would be revealed and steps taken to enhance or improve it where necessary.

The survey was conducted at the close of one of the classroom meetings toward the end of the course, each trainee answering (in a manner so as not to identify himself with his responses) sixteen questions on seven basic issues concerning the eight training stations and twenty substations listed eariler, together with a question on the twelve types of classroom meetings which had been held. The supplementary written comments ran from one to three in number. The results were tabulated and the comments were edited by members of the class, paraphrased, and submitted to the accounting department training supervisors. The following is a summary of the inquiries included in the survey:

1. Time distribution between training stations—Trainees were asked to indicate those sections of the course with respect to which they felt the training period was either too long or too short.
2. Written instructions concerning the work within the training stations—A series of questions was asked to determine the following points regarding written instructions or procedure manuals available to the individual trainee at the various stations:
   a. Were written instructions available for use?
   b. If none were available, would some form of written manual be helpful to future trainees at that station?
   c. How adequate were the available written instructions? (Excellent, good, fair, poor)
3. Oral instructions—The trainees were asked to express an opinion as to the quality and adequacy of oral instructions received from section supervisors and others with whom they worked. (Excellent, good, fair, poor.)
4. Trainee work load—Realizing that one of the objectives of the college graduate accounting training program was to give the trainee a taste of all phases of the work of the accounting department and to make sure that he had an overall knowledge of the workings of the department, the following indications were requested:
   a. Check the training stations in which you felt you were burdened with so much detail work that it gave you little opportunity to "fit the pieces together."
   b. Check the stations in which you did not have enough work to keep fully occupied.
   c. Check the stations in which the work load was "about right."
5. Availability of work space—Lack of work space may have had an effect on the knowledge gained by the trainee. To determine the influence of this factor, each man was asked to indicate where:
   a. A separate and well-located work space was available for trainee use.
   b. A separate work space was available for trainee use but was poorly located. (e. g. away from the section in which the work was being performed.)
   c. No separate work space was available.
6.-7. Availability of section supervisors and division managers for special consultation—Under these broad classifications, questions were asked concerning the role played by the management of the accounting department in the overall training program.
8. Classroom meetings—Because classroom meetings were scheduled twice weekly on company time, each man was asked to express an opinion as to the value of such meetings, which were designed to achieve one or more of the following objectives:
   a. To broaden the knowledge of company organization and policies.
   b. To stimulate thinking.
   c. To improve the use of English, both orally and in writing.
   d. To increase the technical knowledge of the operations within the accounting department.

   The trainees were asked to express an opinion as to whether the meetings yielded:
   a. Little or nothing of educational value.
   b. Some information or understanding which was helpful in the program or would be in the future.
   c. Considerable information or understanding which was helpful in the program or would be in the future.
9. Comments—Finally, each trainee was asked to offer any comments regarding the overall program, which he desired to make.

What They Said

The results of the survey of the program through the eyes of the trainees were presented to the supervisors in charge. Some of the highlights of the survey report and the supervisors' reaction and comments are summarized below:

1. Practically all of the trainees felt that the six to eight weeks training period spent in the factory accounting (time-keeping) division was too long. However, no curtailment of the training period is contemplated. While it was

agreed that the work may at times be monotonous and that the working conditions are less desirable than those encountered elsewhere, it was felt that this phase of the work offers management the opportunity to determine whether the trainee possess (1) the willingness to "stand the gaff" of exacting work under difficult conditions and (2) the temperament suitable for carrying out detail work without loss of interest.

2. More than half of the trainees expressed the opinion that the two to three weeks spent in the machine room of the tabulating division were more than necessary. This is understandable if the trainee does not have or is not given a proper appreciation of punched card accounting in the modern accounting department. Steps are being taken to make this phase of the program more interesting.
3. The opinions expressed by trainees as to the quality and adequacy of oral instructions received from section supervisors confirmed the well-known fact that some supervisors have a better knack of transmitting information than others. The survey was helpful in that it brought to the attention of the training supervisors potential classroom instructors.
4. Also interesting to note was the circumstance that most of the trainees thought that the work in the cost division and the machine room of the tabulating division was too detailed. No change in program is contemplated as a result of this disclosure, as it is felt that detailed work is inherent in those accounting functions and, here again, management can determine whether the trainee is characteristically qualified for the type of work.
5. Efforts are being made to improve conditions in those stations in which the survey indicated that work space assigned to the trainees was inadequate.
6. In general, the trainees felt that section supervisors and division managers were sufficiently available to be helpful in their training and answered questions fully and freely.
7. With respect to classroom meetings, some perhaps startling but not entirely unexpected opinions were disclosed by the survey. For example, a third of the group felt that the sessions on grammar were of little or no value. Several felt that the sessions on machine tool types and uses and on company products could be omitted. The latter comments are due, no doubt, to the fact that these sessions were somewhat technical, involving terminology and language entirely foreign to the average accounting graduate. No change in the curriculum is contemplated as it was the opinion of those responsible that, while these sessions may appear uninteresting to some at the moment, the time will come when exposure to the type of information will be useful.
8. Because many of the group felt that the program would be more challenging if tests were given at the conclusion of certain phases of class-room instruction, written examinations are now given in connection with the sessions devoted to general accounting, cost, internal auditing, factory accounting, and office methods and procedures.

Results Have Been Favorable

That the program has been a success to date, from both the individual and company points of view, is clearly demonstrated by the fact that nearly all the members of the first group, which completed the course in July 1949, are currently assigned to supervisory positions within the accounting and related departments, two have recently qualified as certified public accountants, and three have been promoted to key accounting positions at a new branch plant.

Evidence of management's faith in this type of training program for accounting graduates is given by the expansion of the program to include an additional or mid-year class which began in March 1950. This has been done while continuing the succession of groups composed of June graduates.

Procedures for Prompt Financial Statements

by JOHN F. GAITHER

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Serviceable monthly (or more frequent) statements to management form a continuing goal of company accounting departments. What this goal requires of the accounting staff by way of over-all organization, responsibility assignment, and co-operation among units of the department is outlined by the author of this article in terms of his company's experience.

MANAGEMENT HAS ALWAYS TURNED to the accountant to find out what has happened. Today management turns to the accountant to find out what will happen. The idea that the accountant is an historian has at last gone for good. Today he finds himself cast in many roles. His reports are coming more and more into thir own as an impelling force, a tool to assist management in long-range planning. The rapid expansion of our economy, coupled with marked inflation, has introduced complexities into accounting and production methods not heretofore known. A careful analysis and evaluation of these complexities is the service expected but the service is valueless unless it is timely.

A Set of Statements for Management

We feel that our management needs profit and loss statements of a week's operation within the following week and a complete set of monthly statements within eight to ten working days after the close of the month. The statements must be complete. They must be submitted with full use of descriptive terminology to assure readability. They may be accompanied with charts to present the information graphically in summary form. We consider the essential statements to be:

1. Balance sheet
2. Product profit and loss statement
3. Statement of manufacturing variances by plant and department
4. Supplemental schedules as follows:
   a. Cash summary
   b. Accounts receivable
   c. Taxes and accounts payable
   d. Administrative expenses
   e. Fixed asset detailed analysis

Organizing the Accounting on a Responsibility Basis

Obviously the preparation of these statements on a timely basis requires coordinated work among the various accounting sections. To this team work we owe our entire success in our monthly closings. In order to obtain the desired coordination, it is essential that lines of responsibility be clean cut. Delegation of duties is stressed for maximum utilization of the abilities of the department. The responsibilities are established at the beginning of each year. At that time a standard index of entries is drawn up.

All operations are on a scheduled basis. The department heads meet monthly to set up the schedule. Each section and department has its function, and failure to adhere to the schedule will bog down the entire process. A copy of the schedule is sent to the various employees charged with the responsibility of furnishing either source data or final journal entries. The general accounting department acts as clearing house and forwards all completed work to the tabulating department which is charged with furnishing source data information and final preparation of the trial balance.

The departmental lines in the accounting organization appear as pictured in the following outline.

TREASURER

General
- Property
- Accounts payable
- Accounts receivable
- Billing
- Cashier
- Bookkeeper
- Office services

Cost
- Plant 1-Costs
- Plant 2-Costs
- Timekeeping
- Budgets

Tabulating
- Payroll
- Tabulating

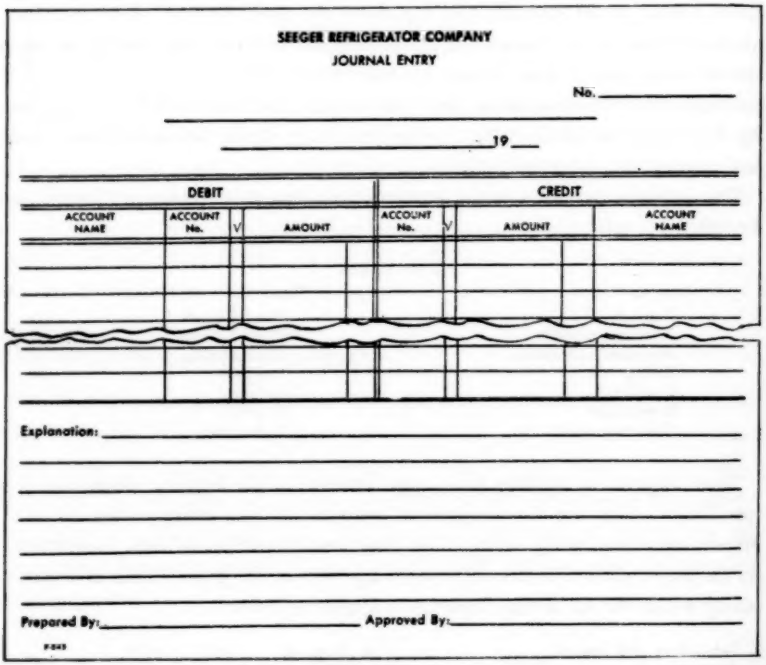
There appears to be three basic steps involved in discharging accounting responsibility. They are the preparation, presentation, and interpretation of data. Preparation entails work by the entire plant and all sections of each department. As the preparation of information heads up with us, the general lines of responsibility within the accounting department appear as follows.

1. Tabulating and payroll
   - Purchase and expense distribution
   - Payroll distribution
2. Cost
   - Finished stock transfer
   - Scrap cost
   - Labor variances
   - Material variances
   - Burden variances
   - Cost of sales
   - Interplant transfers
   - Miscellaneous cost items
3. General
   - Sales
   - Cash receipts and disbursements
   - Depreciation and capital asset disposition
   - Insurance accruals
   - Salary accruals
   - Tax accruals
   - Social security accruals
   - Pension
   - Miscellaneous items

All journal entries are prepared on loose leaf form (Exhibit 1) and must bear the approval of the appropriate department head. It is quite apparent that departmental work must be scheduled to assure a smooth flow of source information from one department to another to avoid any loss of time.

Payables, Payroll, and Billing

The accounts payable section provides source information during the month to tabulating through the medium of invoices, preparatory to issuance of the purchase distribution. The tabulating department uses both a payment card which controls open items and payments and an entry card which controls dis-



SEEGER REFRIGERATOR COMPANY
JOURNAL ENTRY

No. _____

_____ 19__

DEBIT				CREDIT			
ACCOUNT NAME	ACCOUNT No.	√	AMOUNT	ACCOUNT No.	√	AMOUNT	ACCOUNT NAME

Explanation: _____

Prepared By: _____ Approved By: _____

F-043

EXHIBIT 1

tribution of expense and inventory. This system works quite well since it is necessary to keep the purchase record open for several days following the close of the month. It is quite evident that it is impossible to hope that all invoices pertaining to any month's business will clear in time to meet a schedule. However, consistency is all that is needed for sound comparisons and we do not feel

that we change the profit picture by any significant margin under this handling.

We ordinarily make payments every week on Monday. Because of this we must have all invoices processed by the preceding Friday noon. Thus, we can hold our purchase record open only to the Friday closest to the tenth of the month, in order to take as many discounts as possible. For this reason, the purchase distribution is the last entry to be prepared by the tabulating unit.

Our payroll week ends on Sunday and information concerning payroll is sent to tabulating by the timekeeping section. Checks are written weekly on Thursday for issuance on Friday. Departmental charges are collated and summarized for each week and a summary is issued to the cost section covering the entire month under consideration, on the Thursday following the close of the month. If accruals for part of the week are required, it is necessary to use for this the proportionate part of the weekly distribution which includes the days in question, to be added as a separate entry. Salary distributions are handled in the same manner. Duplicate copies of labor and purchases summaries are forwarded to the cost and general accounting sections as soon as the above information is collated. This completes the first phase of tabulating work.

The billing section receives invoicing information from the order and traffic units. The billing staff is responsible for classification, verification and issuance of the invoices, as well as preparation of credit memos. Our system requires two to three days for clearance. A running daily summary of both sales and credit memos is maintained. This information is kept by account number, so it is a fairly simple matter to complete the schedule within the week following the monthly closing and prepare necessary journal entries for sales, excise taxes, etc. The invoices are immediately passed along to the accounts receivable section for posting. The method is synchronized so that accounts receivable detail is available when statements are nearing completion.

Sundry Entries and Costs

The cost and general accounting sections work independently on their entries, except on those which are overlapping in nature. There are certain general accounting entries affecting the factory ledger, such as depreciation, taxes, pensions, etc., which are charged on a departmental basis. In like manner certain cost items affect the private ledger, i.e., charges to reserves, etc.

The cash receipts book is balanced and verified on the last day of the month. Cancelled checks are received the day following and are immediately reconciled for information required for cash receipts and disbursements entries. The property section prepares entries during each month for disposition of equipment.

Acquisitions are, of course, recorded by the purchase entry. Depreciation is prepared departmentally on a standard basis from the budgetary allowance. In general it is subject to adjustment only at the close of the year, unless it appears to be completely out of line earlier. The same is true of pension costs and local tax accruals, which are also charged departmentally. Again consistency receives the emphasis and we find from experience that the adjustment required is generally not a significant amount.

TRIAL BALANCE

SEEGER REFRIGERATOR COMPANY

Acct. No	J.E. No.	Source of Entry Account Total		Source of Entry Account Group Total		Trial Balance Totals		Trial Balance Acct Group Totals	
111	13	900,000	00						
	13	200,000	00						
	13	150,000	00 Cr						
	14	700,000	00 Cr						
		250,000	00 *			3,000,000	00		
112	12	15,000	00						
	14	15,000	00 Cr						
			*	250,000	00	15,000	00	3,015,000	00

EXHIBIT 2

The cost department makes use of purchase and labor distribution and production reports by plants in computing plant departmental expenses, inventory in process, finished stock transfer and material, and labor and burden variances. A summary of the sales recapitulation is received from the general accounting department, when completed, for cost of sales information. The sales and cost of sales reports are also reconciled to the traffic section's stock and order report for verification of shipment and finished stock inventory. The cost department, as indicated, is organized on a plant responsibility basis for delegation of detail.

All the journal entries prepared by the various departments are forwarded to the tabulating section for punching. They are then returned to the bookkeeper for binding into a book for future reference.

The Statements Emerge

So much for the preparation of detail. All is in readiness now for results. After punching the entries, the tabulating department prepares the trial balance (Exhibit 2) which has unique features. The trial balance tape includes the following information:

1. Account number
2. Journal entry number
3. Journal entry amounts
4. Monthly group totals
5. Accumulated account balance
6. Accumulated group balances

The trial balance requires approximately four hours for complete processing. This includes punching entries, balancing trial balance cards, and listing. As the tape is run, the cards are summary punched to form the accumulated balances to be picked up the following month. As sections are completed, they are forwarded to cost and general accounting for advance work. The monthly group totals and accumulated group totals tie in to the account classification book by asset, liability, and reserve groups for balance sheet purposes and to sales, cost of sales, and variance for profit and loss purposes.

The tape amounts are posted to a regular work sheet form by the general accounting department for adjustments and profit determination. The miscellaneous adjustments to the private ledger, if any, are made. The cost department meanwhile is posting factory ledger amounts to distribution sheets for departmental allocation of general plant expenses. While the cost department is determining these final adjustments, the general accounting department is preparing all supplemental schedules which are not affected by the departmental allocation information and is making the administrative expense allocation to plants. Immediately upon receipt of manufacturing variance by plants, the required adjustments are posted to the work sheet and the profit is determined.

All the information so recorded by general accounting is on a year-to-date basis. Hence, the formal statements of a year-to-date basis are taken off the work sheet. It is then a simple matter for the current month and prior months to be compared for preparation of the monthly statements at the same time that the cost department is preparing variance statements by departments for budgetary control and analysis of actual cost to budget, as well as inventory detail.

Once Over Before Circulation

The final statements are reviewed by the chief accountant, chief cost accountant and treasurer to determine their propriety. A summary of weekly statements is prepared for reconciliation of deviation from the monthly report. Certain financial ratios are noted, the statements are analyzed, and are then bound for forwarding to the top office.

The system described has been evolved through years of analysis and review, with refinements constantly being made and accounts and grouping revised for greater efficiency. In all changes emphasis is being put upon the need of management for the reports.

Phonograph Records Are Made On Schedule

by THOMAS J. DAVIS

Plant Controller, Capitol Records, Inc., Scranton, Pa.

A case study of operation in the record industry is afforded by this article which gives details of one method of coordinating accounting and production control records in order to minimize the necessity for duplicate reports and at the same time to furnish factory management with the tools necessary to measure and control production.

THE NECESSITY FOR PRODUCTION CONTROL is well known to all. The phonograph record manufacturer, however, requires a far tighter control than do the majority of companies today. His controls must be of such a nature as to permit him to act quickly and positively at all times, inasmuch as days and even hours are extremely important in the record business. To illustrate the necessity for production control and in order to give a better background to readers not familiar with the industry, it may be well to discuss at this point some of the items which must be considered in the production of a phonograph record.

The presentation of a musical selection to the general public is very similar to the distribution and delivery of fresh produce or dairy products, in that the item is of a highly perishable nature. The demand for a particular selection rises and falls with extreme rapidity. This is especially true of the so-called "pop" or popular tunes, although it does not apply to the classical market. Since the classical market is extremely limited and small in comparison to the market for popular selections, the bulk of every record manufacturing company's effort is placed in the popular market. As with physically perishable products, this product must be controlled and expedited through all phases of manufacture and to the ultimate point of distribution as quickly and as accurately as possible. The record or group of records which arrives in the dealer's hands after the demand has ceased or has transferred to another tune or artist, has no more potential sale than would spoiled milk.

From Recording to "Stamper"

In preparing for the distribution of a number, the repertoire department selects what, in the opinion of the staff, would be a salable tune and picks the artist whom they feel would best fit it. The recording session is then scheduled and the tune is recorded on magnetic tape. Past practice was to record directly on an acetate lacquer disk. There is, however, greater flexibility in the use of

tape. From the recorded tape, a dubbing or re-recording to an acetate lacquer is made and it is from that point that the actual preparation for manufacture begins.

The acetate lacquer is flown to the plant from the recording studios in Hollywood or New York, as the case may be. The lacquer disk is put through an electroplating process which transforms it into an exact duplicate of the original recording except that it is now made of metal and the cuttings and groove markings are reversed. This is termed the master recording. From this master recording is made a protective "mother" which is an exact opposite of the master in the sense that the metal part resembles the original lacquer. From the mother another electroplating step is taken in which the ultimate tool for use in the processing of records, called a "stamper", is made. It is this stamper which is utilized in the pressing of the phonograph record. The process from acetate lacquer to stamper requires from twenty-four to thirty-six hours. Production control related to the production of the stock of records now begins.

Manufacturing Schedules and Production Reports

The repertoire department schedules to the manufacturing plant the quantity of records intended to represent potential sales for a period of seven to ten days. It is made up of the numbers to be released during the week. The schedules are received by the manufacturing department just a few days prior to the time of pressing. In order to secure control and to expedite the process, all such orders are fed through a central production control department at the plant, the main job of which to prepare the factory for the production of the quantities scheduled by the home office in the case of initial release records and also to prepare the factory for re-runs of orders received during the work week.

In connection with developing this information, a punched-card tabulating system was installed which can prepare in one punching a multitude of reports for factory management for use in production, inventory control, and billing operations. The type of reporting which has been in use in most manufacturing plants is now too slow to satisfy the requirements of the records industry. Through the use of simplified procedures, the tabulating system can and does produce a summary report of all orders received during a given day and, by multiple use of the same cards, permits the shipment on the day ordered of between eighty and ninety per cent of all numbers.

This is accomplished by the use of production control reports prepared daily. These feed through the accounting department and to all operating departments, giving each department concerned the necessary information as to the status of

all manufacturing facilities each day. The following comprise the daily reports now in use, which are prepared for each department:

1. The total production of all records and albums by type and size of record and by playing speed.
2. The total day's production of all records by individual selection number.
3. The total production of albums by album number.
4. The matrix production by size, type, and selection number.
5. The total production by operator.
6. A statistical report on rejects, showing type and quantity, by operator.

From the above it will be seen that control is maintained from the over-all standpoint and also down to the individual operator daily. Supervisory personnel is aware almost immediately of any change in plant operations which will affect either the output of each press or the quantity of rejected records being discarded by the inspection department. This may appear at first to be a tremendous statistical work-load, but an analysis of the various operations indicates that they are all derived as by-products of original entries required for either cost accounting or general ledger accounting.

For example, the report on production by number which furnishes the order service department with a complete picture as to the progress being made by the various records through the plant, is produced from the same cards as will later create the entry to inventory control. The same holds true for the so-called collating report of production by album number. The production by operator and the statistical information on rejects per operator actually forms a secondary report derived from the piece-work check computations necessary for computing payroll.

Sales Orders Set Off Chain Reaction

To give an idea of the speed with which production control works, it will help to follow a single order through the plant, step by step. In this we will assume a certain set of characteristics for the order. We will assume in the first place that the factory did not have sufficient inventory on hand to fill the complete order when it came in. Although it is impossible to manufacture ahead of time just the quantity of a record to equal an unpredictable demand, it is necessary to have at least some stock immediately available in reserve in the case of abnormal demand for one or more numbers. Since the fifty distribution points in the United States are allowed to order any quantity any day in the week, the factory office staff has to be geared to handle practically any volume of orders.

The order is passed through a "check" department to verify the various entries made on it and it is then sent to the tabulating department and key

punched immediately. As soon as it is verified through the key puncher, it becomes, along with all the other orders received that morning, the subject of a report prepared by half past ten, which gives the factory a complete picture of each and every number ordered. The tabulating cards are then compared to a book inventory maintained daily and, as soon as it is ascertained that there is sufficient merchandise on hand to ship portions of the orders, the applicable cards are transferred to a separate file for use in preparing what is termed a pick sheet.

This pick sheet is actually a preliminary order to the shipping department, instructing it to assemble and pack for the particular distributing point the merchandise on order and available that day. As soon as the tabulating department locates a number which does not show sufficient inventory to make a complete shipment of the order, an operator punches a card for the quantity on hand and a separate card for the quantity on back order. This is placed immediately in the back order file. The back order report, showing the number in question, together with all other numbers in a back order status, is prepared daily and forwarded to the order service department.

The order service department notifies production control of order quantities not available in inventory. The latter department begins at once to revise schedules to prepare for production of sufficient records to meet the outstanding orders. The revised schedule involves matrices, labels, press time and machine operator time—all of which are functionally under the production control department. By this it is meant that the factory is required to receive the changes in production scheduling and act upon them in the time scheduled by the production control group.

When it has been determined that a sufficient quantity of labels and stampers is available, the presses go into operation and, usually within twenty-four hours, the merchandise is produced and ready for shipment. If, however, the production control department ascertains that sufficient quantities of either labels or metal parts are not available, it is its duty to contact the purchasing department forthwith and schedule the necessary materials through the printing house or through the matrix department. From that point on, the control of the number in question reverts to the order service department. It is its duty to compare a daily production report with the back order report on file in the department and to expedite through production control any record or records which appear to be either not in production or else under-scheduled.

Since the pressing of the record is accomplished in as short a time as possible, it is necessary for the succeeding departments to have full knowledge

of the quantities in process throughout the factory. After pressing, the next step is the "finishing" of the record, after which the entire group of records is passed through an assembly line to the packing department. At a given point on this assembly line, the records are tallied as to quantity and selection number and, twice each day, these tally sheets are accumulated and forwarded to the tabulating department, where they are immediately punched and tabulated for the assistance of the order service unit. The cards are then made a part of the perpetual inventory maintained by the tabulating department. When the semi-daily production tabulation shows that a certain quantity of a selection number has been finished, the back order file for the particular number is assembled and the proper quantities are immediately processed for shipment to the various distribution points.

The same card which was the basis for the original report on orders received during the day is then further processed and becomes the posting medium for the following items:

1. Shipping order.
2. Inventory control deduction for shipments.
3. Preparation of invoice.
4. Preparation of other statistical reports.

Album Production Involves Careful Timing

Another production control problem relates to that of album production. The preparation of an album of records requires that the coordination of all departments be maintained so that the proper quantity of records of each number will be prepared and forwarded to the collating department for assembly. Only in this way will it be possible for the album to be packed and ready for shipment prior to the release date. This coordination is accomplished in essentially the same manner as control of production of individual numbers, except that personnel responsible for albums must go back further than factory operations in order to accomplish complete scheduling. This brings into play a field expeditor and three sections of the purchasing department.

The preparation of an album naturally begins with the selection of the artist and title. Cover design, basic colors, and all other specifications must be accumulated so that plates may be prepared for the printing of the covers. This work must be scheduled in sufficient time to allow the printer to complete the color work in accordance with the time schedule, to allow for shipment of the empty album to the factory coincident with the completion of the pressing of the records. This is accomplished by the use of tabulated field expeditor reports and established deadline schedules for release.

Measurement and Control of Operator Productivity

The measurement of production per operator is a very necessary part of productional control, inasmuch as any variation from standard performance on the part of press operators could cause either a burdensome inventory position to be built up or, on the other hand, a serious shortage of records of one selection or another. As an example of the methods used to control the total output of the press floor, a little background on the method of handling records may be helpful.

The standard 78 rpm record is produced on the basis of a production order. Usually it is safe to anticipate that a small percentage of all records produced will be discarded because of scratches or other minor blemishes which in many cases do not affect the quality of the music but do impair the appearance of the merchandise. The press operator has at his side a rack with a capacity of fifty-five records. One piece-work check is issued for each fifty good records required by the order service department. The rack places a limitation upon the individual press operator's output by controlling, within five to ten per cent, the actual quantity which he can press. Since the majority of operators are on piece-work and since it is to their advantage to press as many records as possible in a given time, there is a temptation to maintain a constant pressing rate, even though an operator might know that the quantity needed is not great. By the issuance of the tickets limited to the total production required, any element of decision upon the part of the operator is eliminated and the production is maintained within the limit set by the order service department.

This problem of controlling the production of the individual worker is common to all industries but is perhaps more marked in the phonograph record industry. In normal operating times the plant runs about two hundred presses. During some months of the year there are two shifts. Occasionally there are three. The necessity for constant supervision is always present when a work force of this size is involved. In order to keep supervisory personnel informed at all times as to the performance or non-performance of any press operator, provision is made for the accumulation of production daily for each individual operator on his regular shift.

Standards in the plant have been based upon the average output of a known group of pressers and it is the problem of the supervisor to maintain the general average of his section of presses in close proximity to the average established. Time and motion studies, made in cooperation with the union but as yet not completed here, will furnish more scientific figures on standard or normal

press operator output per hour or day, taking into account the normal allowances due to personal habits, operator fatigue, etc.

On presses which at the present time do not carry a piece-work or incentive rate, the problem naturally is greater than on those carrying the piece-work rate. It has been found that, in many cases, habits of long standing have limited the operators' production output.

Effect of Changes in the Manufacturing Process

Another problem which arises in connection with the measurement or control of operator output is the evaluation of changes made due to technological improvements in machinery and methods. For a good many years the record industry had maintained the same pattern of work and the same type of material with little or no change in the manufacturing process except for improvements in recording techniques. However, the advent, of the "microgroove" and the slower playing-speed records caused a minor revolution in the industry. Prior methods of production and inventory control were suddenly prime targets for improvement.

The problem of inventory control is, in many cases, essentially a problem of production control, for the simultaneous production of numbers in three different playing speeds could easily create a chaotic inventory condition at the factory level. Studies were made and are being continued, to standardize all techniques possible from the recording to the last stage of manufacture. Tremendous improvements have been made in the past two years. The problem of production control of operator output has also increased in view of the fact that a greater degree of care is necessary in handling the vinylite type records as compared to the old type records made of shellac and ethyl cellulose.

Increased Reliance on Accounting Staff and Procedures

All of these changes have forced a constant change in the record-keeping procedures and have altered management's concept of the functions of the accounting department. These are now recognized to conclude broad coordination with other control departments. The necessity for speed has brought about the introduction of tabulating equipment and other modern business machines. The promptness with which reports are required makes it imperative that the entire accounting staff be organized in such a manner that there will be a minimum delay in the accumulation of the necessary information and in the flow of paper work all along the line.

THE WORKSHOP

A Touch-Up On Work Simplification

by IVORY C. JONES

Controller, Commercial Shearing and Stamping Co., Youngstown, Ohio

WORK SIMPLIFICATION as a science is fairly new but, as a practice, it is as old as time. Even Noah used its principles. He paired off the animals before they got on the ark. Then too, he did not drag the ark down to the water—he just built it on a hill and let the water come up to it. Work simplification does not require a specialist to put it into practice. A housewife practices it every day when she puts the potatoes on before she starts to fry the steak. She has also found that she can save plenty of travel time by arranging her cupboards to fit the work area. She practices simplification through experience and planning and by reading about the latest methods.

Neither does work simplification necessarily involve a large unit of performance improvement to be worthwhile. An average key stroke on a typewriter takes only .0036 minutes. When a shipyard recently reported eliminating 275 key strokes from the typing of a certain form, the saving could be viewed as less than a minute's typing for the average typist. However, on 50,000 forms the savings added up to 103 man-days. A small saving on a job of high frequency is just as important as a large saving on a job of low frequency.

Principles—And a Strong Arm

What work simplification requires is the ability to think in terms of basic principles. Methods differ with each business and change as conditions change, but principles are unchanging. One cannot be too familiar with primary principles. A surprising number of seemingly intricate problems resolve into their elements when we diagnose them according to the maxims. We find writers adversely criticized as being too academic or a technical paper scorned because it fails to tell us precisely how to do some specific thing. However, it is this robust impatience with the theorist which has led us into what might be called a "cookbook" philosophy, blind acceptance of recipes for "how" coupled with complete disregard for the "why."

Among principles of work simplification, one which rises to the level of a good working rule is to first analyze each situation to determine whether

less instead of more system may not be the remedy. To be practical, any systems installation must return an affirmative answer to the following questions:

1. **Is it necessary?**
2. **Has it been reduced to the utmost simplicity?**
3. **Do the results justify the operating costs?**
4. **Can any clerk understand it?**
5. **Is it up-to-date and is the information available when wanted?**
6. **Does it stimulate an enthusiastic response all along the line?**

Systems which cannot pass this test are either slated for continual revision until they do pass or else the operations which they affect will fail to arrive at the efficiency desired. Of course, adherence to principle is but part of the approach. Clean cut action is often needed. History tells us that Alexander the Great visited a temple where there was a chariot tied with the famous Gordian knot which no one had ever been able to untie. A legend existed that whoever untied it would rule the world. After Alexander struggled with it for a while, he took out his sword and *cut* it off. Every office and every accounting department is tied up with some of these Gordian knots which should be cut. Many reports and sometimes whole routines should be done away with at one stroke of someone's knife.

About Mechanization and Thinking

Mechanization in the office has gone a long way in recent years but, like other good things, it can be overdone. Let us always analyze the routine first to see if mechanical equipment is really necessary. Let us not mechanize just for the sake of mechanization. Also, when mechanizing, we must not fail to look out for the accompanying problem of bottlenecks. This is less of an element in hand operations. I am not saying that we should not make use of mechanical equipment, only that we should make sure that the use of mechanical equipment is the best way before we decide to purchase or rent such devices. They may well be needed, especially in the light of increasing rates of pay of office employees, including the now well-known "fringe costs."

Speed and accuracy in clerical work, whether manual or mechanical, can be attained only by eliminating the personal element in the greatest possible degree by making the performance of *routine* work as nearly mechanical as possible. In order to do this, jobs must be broken down into operations and also deskilled insofar as possible.

In this connection, we often hear that employees should cultivate the habit of thinking about what they are doing. Generally, in routine jobs, the exact opposite is desirable. A routine which everlastingly demands the making of decisions usually causes a great deal of confusion. It is like going down a flight of stairs. Pay no attention to the movement of your feet and they flit over the steps with never a

sign of hesitancy or faltering. Try to watch them step by step and you will either have to slow down, or you will presently miss a step and stumble, or fall.

Attitudes Are Involved

The approach to work simplification must sometimes take rather full account of human nature. We who are engaged in accounting work are all to some degree in the same position as the farmer who could never seem to get things done in the right way at the right time. A neighbor once suggested to him that he send to the state agricultural college for some booklets on the scientific handling of soils, crops, and livestock. "No," replied the man, "I'm afraid that wouldn't help me much. You see, I'm not farming half as good as I know how to now." Thus it is that sometimes an existing method should be worked more fully, even if defective, rather than replaced—at least for a time.

There is one approach to re-systematization which is almost certain to be disastrous in its effects. This is the "economy wave" approach when someone at the top issues a mandate that the payroll in every department must be reduced by a flat percentage, without any thought given to the amount of work performed or to the operating efficiency of the various departments. In work simplification, it is clear that information should go up before decisions come down, certainly decisions of this kind. The only permanent way to reduce the cost of a department of function is to reduce the motions required for the performance of the work. This may be done by the elimination of unnecessary forms, reports, and outmoded procedures, and the simplification of the remaining ones.

Forms, reports, and appendages to existing systems do spring up like the heads of Hydra before the assault of Hercules. Every time you eliminate one, two others seem to take its place. It has been said that any form, report or system which has been in effect for two years should be reviewed to see if the original need for it still exists.

Obsolete Routines; Thumb-worn Papers

The mists of antiquity can descend quickly upon the aggregate "system" in any office. An instruction given in August can be obsolete by December. This is a functional weakness in an organization even when it concerns a policy originally carefully considered. It is doubly a weakness when it concerns some decision given hastily by an executive. He has to decide something in a hurry and makes his decision for the moment. Months, perhaps years, later he finds his decision, now become mischievous, still in force and its origin, as far as those who observe it are concerned, lost in the past.

For these reasons, the principle that the system in force in every part of the organization should be reviewed and revised at frequent intervals merits top attention. There is not a form or system that should not be reviewed at least every few years. Many will instantly show the need of change or elimination. There is a story which illustrates this point. Several years ago a company published a magazine for its customers and prospects. The editor, wanting to see if the recipients of the magazine were buying the company's products, asked that sales to them be summarized. Four years after discontinuance of the publication sales statistics were still being tabulated on the last mailing list.

Unnecessary handling of papers may possibly match obsolete routines as a cause of profit diminution and as a call for work simplification. Here again, there is a story in point. The manager of a mail-order house once called his clerical force together and exhibited an incoming order to them. "I want you," he said to them, holding up the order sheet between his thumb and forefinger, "to visualize this order as being coated with a thin sheet of gold leaf. That gold leaf is the profit on the order. Every time it has to be touched for any purpose whatsoever, a little of the gold leaf comes off and that much of the profit is lost to the business."

That principle applies through all office and accounting work. Every time a sheet of paper of any kind has to be touched, some of the profit of the business is rubbed off, never to be made up. This should be kept in mind when distributing copies of data. Every copy must be read and filed, usually involving the time of two persons.

A Goal: Minimum Complexity

Nevertheless, in spite of what has been said in this paper, even simplification does not go without saying. It should be distinctly understood that the aim in any office system is not solely extreme simplicity of design. An office system is merely a mechanism for the production of specialized information and, like any other necessarily somewhat complicated device, should be judged not so much from the standpoint of simplicity of design as from the results obtained from its use.

To condemn any system on the sole ground of its complex design would be as absurd as to complain because the modern automobile is far more elaborate than was Trevethick's and Jones' steam carriage which astounded and alarmed the pedestrian of 1802. The earlier machine was absurdly simple in design, but no one would claim that it was superior. The question is not so much whether a system is simple or not as whether, taking all factors into consideration, it is as little complex as the conditions warrant.

Cradle-to-the-Grave Control of Paperwork

by J. B. PIERCE

Plant Accountant, Navy Ordnance, Division, Eastman Kodak Co., Rochester, N. Y.

LIKE MANY OTHER COMPANIES, we had long recognized the need for some form of positive control over clerical work. Controls had been established over direct labor, manufacturing processes, materials, and the many other factors which go into the operation of the plant, but the clerical work had been left largely to the discretion of the various departments, primarily because of the lack of necessary tools by which it could be measured and controlled.

Some effort, naturally, had been previously expended to attack the problem through methods surveys, but the process was necessarily slow and spotty. Moreover, the survey approach did not by itself provide control over a procedure once it had been established. What was required was a tool through the use of which continuing control could be exercised over the vast bulk of paper "production" and, hence, to a large extent, over clerical effort. An analysis of the problem indicated that most of the papers passing through our plant were subjected to the following:

1. Design or preparation
2. Printing or duplicating
3. Storage and distribution
4. Processing
5. Filing

The logical approach seemed to be to establish controls at these five points. It was determined that functionally this control should come under the accounting section which would administer it through the methods staff. It should be pointed out that control at all these points was not achieved at once. Rather, even though the overall picture was constantly kept in mind, the control points were established one at a time and only as the result of broad discussion at the management and departmental levels. The assurance of cooperation, which was a by-product of these deliberations, was we believe, of prime importance.

Design or Preparation

The first step taken was to obtain a ruling that any form printed outside the plant must be ordered by the methods staff. In this way in about a year, control of all major forms was acquired. As a new form was ordered or an old form re-ordered, an investigation was made into the form itself and into the procedure in which it was used. The principles of forms design were applied and the serviceability of the form was checked, to be sure that it could not be eliminated or combined with another form. Form numbers were established, coded to the func-

tion of the form, and a file was set up giving the complete history of each one. Careful check for consumption, paper type, size and weight, was conducted before any order was placed.

Control over forms printed on office duplicating equipment was established either by bringing the equipment directly under the methods unit or, where this was not practicable, by centralizing the equipment in terms of its location and administration and maintaining a close surveillance over the work as it went through. In practice this meant that mimeograph and multilith equipment was placed under the methods staff and other methods of reproduction, such as Ditto, photostat and ozalid, were centralized in order that the work could be readily surveyed and controlled.

As a result of these activities we were able within about a year to eliminate 98 of the 415 forms then active. In addition, improvements to the majority of the active forms were made covering many factors such as design, size, and ordering quantities. In addition, control at the point of ordering or preparation permitted a close screening of new forms and kept their number at a minimum.

Printing or Duplicating

Originally the bulk of our forms were printed outside the plant. As progress was made in the study of these forms, however, it began to appear that numerous advantages might be gained by installing our own equipment. An intensive survey confirmed this belief and, accordingly, an offset duplicator was purchased, together with a paper cutter and drill. In the first year of operation approximately 1,500,000 impressions were run on the machine, consisting of both forms and reports. The indicated savings over this period were approximately 50 per cent of previous outside printing costs.

Further, the shortened ordering period, together with the ability to economically run smaller quantities of forms, brought about a reduction in the forms inventory of about one third. Not only this but having the equipment to cover all forms requirements quickly has made it possible to take steps toward the elimination of perpetual inventory records of stationery, substituting instead a bin or visual type of inventory control and thus saving a substantial amount of clerical time.

In addition to the savings in the printing costs of forms, the cost of reproducing the more important reports which were previously printed outside, was substantially reduced and, on the whole, the reports were improved in appearance.

Stocking and Distribution

The next problem was the storage and ultimate distribution of forms to the departments using them. We de-

cided that all forms should be stored and distributed from a central stationery department rather than delivered directly to the departments for which they were ordered. Two reasons were behind this decision. First, central stocking made it more practicable to allow sufficient time to investigate a form after a minimum balance had been reached. Second, forms storage at a single point brought to our attention any unusual increases or decreases in the consumption of a form, thus signalling variations in activity affecting order quantities or possible variations in procedures.

It became apparent, particularly after the establishment of our own printing equipment, that the supply of a form should, in general, be held to a three or four month supply and should rarely exceed a six month supply. On our own equipment any increase in costs arising from the smaller quantities was largely theoretical and was more than compensated for by two major advantages. First, each form was investigated as it was re-ordered, making it possible to check each item two to four times a year and to keep it in line with changes in clerical procedures. Second, the loss in forms due to obsolence was held at a minimum. These ran about one per cent of the total form cost.

Processing

It is, of course, impossible to control clerical procedures entirely by the control of the forms used in those procedures. For the intensive study of any procedure, the methods survey must still be relied upon. It then becomes a vital part of the over-all control. Under our procedure, sources of subjects for survey originate from three main points:

1. **Assignments directly from the head of the accounting department.**
2. **Assignments resulting from requests by other departments that a procedure be surveyed.**
3. **Assignments resulting from form surveys in which the investigator has detected trouble in a particular procedure. It is interesting to note that the bulk of our surveys have had their origin in the investigation of a form. Constant re-investigation of forms thus paves the way for, and works hand-in-hand with, methods surveys.**

Filing

The last step in "cradle-to-the-grave control" of paperwork, but by no means the least, is control over the final filing of forms. A survey of plant filing habits indicated a rather staggering expenditure of time and material for this important but often entirely overlooked operation. A glance at figures for paper consumed yearly gave some idea of the magnitude of the filing job when it was considered that the bulk of it had to be filed, at least for a time, and that storage facilities had to be provided.

The installation of controls on filing presented greater difficulties than did any of the other forms control features which have been discussed. This was primarily due to the common ten-

dency of groups and departments to obtain a copy of every form and report with which they were in any way connected, to meticulously file these copies, and to maintain these files indefinitely. Since complete cooperation was vital to the whole project, the job of files revision was undertaken only after this cooperation was assured through a major "selling" job.

The problem was approached by taking each form or regularly issued report and asking the following questions or question groups of those receiving a copy:

1. "Do you need to receive a copy?" "Are you in a position to do something about the information? Is it related to one of your functions or is it merely a matter of interest?"

   These question were basic, since each copy represented much more outlay than the cost of the paper on which it was printed. It represented the time of any employee who read the information, the time of a clerk who filed it and the cost of the filing space necessary to store it. Elimination of a copy eliminated all of these cost elements and hence attained the maximum economy objective.

2. "If a copy is essential to the operation of your unit, do you have to file it?" "Is the information of such a temporary nature that the copy can be read and then destroyed?"
   If such was the case, the filing time and storage space requirements were eliminated.

3. "If you have to file the copy, can it be destroyed after a reasonable period of time?"

   Retention periods necessarily varied. The requirements of normal business operation, together with the special requirements pertaining to documentary evidence in support of government contracts peculiar to our operation, made it obvious that certain copies of forms and reports must be retained.

A centralized filing procedure was established. As each form was investigated for filing instructions, form index sheets were distributed to each department using the form. These sheets listed the form name and number, purpose, distribution, and disposition to be made of each copy. The aim on each form was to achieve the ultimate destruction of all but one copy. This would be stored in the central file for reference by all departments. Of course, it was not always possible to accomplish the objective, as copies may carry varying essential information.

The method adopted may be illustrated with a random example. A certain form was originally issued in about thirty copies, each copy of which was filed and retained permanently and represented about two file cabinets of material per year, in addition to the processing and filing time required. As a result of a survey, six copies were eliminated entirely and it was possible to arrange for filing disposition of the remainder as follows: (1) One copy, a ditto master used in the preparation of changes, was retained by the issuing department, (2) one copy was sent to the central file for permanent filing, (3) one copy was retained by a government office (over which we had no control), (4) eight copies were destroyed without filing and (5) thirteen copies were sent to the central file for destruction after periods ranging from six months to a

year. The savings in clerical time and filing facilities are apparent.

One of the vital points of the central file system was what might be called the "follow-up" aspect. It was our experience that the issuance of index sheets was not sufficient in itself, that once a department filed a form there was a tendency to let it remain there. Consequently, cross reference card files were established for each form. One card was set up by form number and the other by the month in which the copies were to be sent to the central file, usually July and December. In this way, it was possible for the central file clerk to follow up and see that departments, where required to do so, sent their copies to central file for permanent filing or destruction. This "follow-up" was further aided by a policy ruling that the acquisition or transfer of filing equipment could not be made without the prior approval of the methods staff.

The results of the central filing operation have been gratifying. In the first year of operation, the equivalent of approximately fifty-four drawer file cabinets of material was destroyed. This represented a saving of $2,500 in file cabinets alone and, at the same time, provided all departments with easy access to semiactive and inactive records.

Favorable Experience

It is our belief that the over-all control of paperwork which has been described, has permitted the establishment of a maximum degree of control over clerical operations, with a minimum staff. By physically locating the printing and stationery departments, the central file, and the necessary methods unit in the same area, a large degree of interchangeability and cooperation of personnel has been furnished. This has enabled us to establish and service the complete setup with three or four people, together with occasional assistance from the accounting department on large-scale methods surveys.

After approximately a year of operation of the complete system, we have proven to our own satisfaction that cradle-to-the-grave control of paperwork is a control, not merely for the sake of control, but one which has more than justified itself on a dollars and cents basis.

Important Factors in Forms Analysis

by R. H. JONES

Works Auditor, Sharon Steel Corp., Farrell, Pa.

ALL FORMS, RECORDS, AND REPORTS are the reflection of clerical activity, and unnecessary forms or duplication of forms and reports lead, in turn, to unnecessary work or duplication of work. No clerical activity is completely efficient unless the forms and reports through which this clerical activity reflects itself are rigidly controlled in relation to the procedures involved.

A Start on Forms Analysis

To analyze forms it is necessary to know which are currently in use, who prepares them, how they are prepared, who uses them, and the necessity for them. These facts can be obtained through the use of a simple questionnaire which develops the following information on every form currently in use within the organization:

1. The department, division, section and unit where the form is prepared.
2. The title, form number, and a brief description.
3. Authority for its preparation.
4. Frequency of issue and number of copies.
5. Elapsed time between date of form release and last date of the underlying data.
6. Distribution.

The completed questionnaire should be returned to the analyst with two copies of the filled-in form. The analyst is then in a position to direct inquiry to all persons and units designated as recipients of copies of the form to determine the extent to which use is made of information on the form and to determine also whether or not other sources just as convenient and complete, are available to those receiving units. This situation, if it exists, may not be apparent either to those who prepare a form or to those who use it.

Elements of Forms Design

When the elimination of a form is not advisable, attention should be given to the possibility of combining the form with another having similar purpose and information. This may frequently be accomplished by studying a group of related forms and breaking down each individual item of the various forms.

If a form is a necessary one, the matter of proper design then comes to the fore. Some of the important objectives of good forms designing are as follows:

1. Logical sequence of items.
2. Continuous execution.
3. Minimum of writing.
4. Adaptability to machines.
5. Economy of space.
6. Sized for binders, files, envelopes, etc.
7. Ease of identification.
8. Attractive appearance (particularly in external-use forms).

9. Ease of reading and/or posting, etc.
10. Clarity of directions (particularly in external-use forms).

In applying these guiding principles in evaluating the design of a form, it is first necessary to know the purpose of the form. All too often the original purpose for which a form was prepared is, by reason of change in system, largely obscured. Here again the initial question is, "Why is this form necessary?" The next step is to determine what information is required to meet the purposes to be served and the easiest source from which to secure the necessary data. Having decided on what items must be included and the readiest source, the final step is to design the form so it can be prepared with a minimum of effort and, after completion, can be used effectively.

Functional Factors in Design

In designing a form, it is most important to recognize the difference between merely arranging all the items on the form in a pleasing manner and arranging the items so that the form can be easily and rapidly completed and will provide the necessary information in logical sequence. Functional form design, which related to the completion and use of the form, is often placed in a position of secondary importance to that of physical specifications which related to the kind of paper used, form size, padding, punching, etc.

While the physical specifications are important in that they determine the purchase price of the forms, it is a mistake to assume that the purchase price, because it is tangible, represents anything like the total cost of the completed forms. The average form costs less than one cent per copy but, when the value of the labor and overhead involved in completing a form is included, this cost may well be ten times greater. Therefore, the functional design of forms is the more important element. Some important points are as follows:

1. Every form should have a clear and descriptive title.
2. The data to be entered should be clearly defined. The captions should be brief but abbreviations should be avoided.
3. Only essential information should be called for.
4. Instructions should be clear and concise.
5. If a form is to be continued in use for some time, it is well to assign a number to it to serve as a positive means of identification in any kind of reference.
6. Spaces for entering data must be properly proportioned. It is well to bear in mind that hand-written forms normally require more space than those completed by machine.
7. If the form can be completed in conjunction with or combined with another form, every effort should be made to do so.
8. Whenever a new form is introduced or a major revision is made on an existing form, other forms used in the same procedure should be checked to determine whether or not they, too, should be revised.
9. The form should be identifiable if it becomes detached from a file of related papers.
10. Filing data should always be placed as near the top of the page as possible.

11. It is desirable to place all headings at the side of or above the space provided for the answer.
12. Any form which is to be completed in whole or in part by machine should, if it is to be used efficiently, be designed to meet the requirements of the particular machine.
13. If the form is printed on the reverse side, consideration should be given to using "tumble" or "head-to-foot" design.
14. The use of colored paper should be confined to those instances in which it contributes to the efficiency of the operation.
15. A combination of light green or light brown printing on white paper, lessens the eye strain and makes the filled-in part of the form much easier to read.
16. Ample space should be left for margins and for binding.
17. When an operation involves the completion of a large quantity of the same form by a writing machine, the possibility of using continuous forms is largely determined by the amount of data to be entered on the form and the quantity of forms completed at one time.

Physical Factors In Design

In determining the standard size of a form, there are several considerations. Among these are: (1) the paper size used to reproduce the form (basis sheet size), (2) method of reproduction, i.e., the kind of duplicating or printing equipment used and the running size of paper for reproduction machine, (3) the size limits of the writing or posting machine (typewriter, bookkeeping or accounting machine, or other recording machine or device), and (4) the type and size of the files, trays or binders used as housing equipment. Failure to consider all of these four basic factors in selecting standard sizes of forms will result in waste and excessive costs.

The dimensions obtained by cutting basis sheet sizes into various smaller sizes without waste, are normally considered to be established standard "finished" sizes of stock. However, they are not always standard form sizes. Basis sheet size 17″ x 22″ (or double size 22″ x 34″) is the most commonly used size for printing stationery and record forms on bond, tissue, and ledger stocks. This sheet can be cut a number of ways, without waste, by dividing each dimension into a whole number of parts, as follows:

Dimensions	Divide by				
	2	3	4	5	6
17″	8½″	5½″	4¼″	3¼″	2¾″
22″	11″	7¼″	5½″	4¼″	3½″

The results of the division of the 17″ dimension should be multiplied by the results for the 22″ dimension to determine the number of finished size pieces obtained from a basis sheet size. For example, cutting pieces 4¼″ wide from the 17″ width gives 4 "out" and cutting pieces 5½″ from the 22″ length gives 4 "out." Multiplying 4 x 4 results in a total of 16 pieces cut out of the 17″ x 22″ sheet.

In order to determine the grades of paper to be used for printing forms, the two basic factors of paper specifications, chemical purity and physical strength, must be considered. Chemical purity determines the permanence of the paper. Physical strength relates to the amount of handling which the paper will withstand.

Before Use—and After

Where the volume warrants, the forms should be kept in a central supply room and distributed from there. Factors to be considered are:

1. Monthly usage.
2. Number of months of stock to be carried.
3. Delivery schedule.
4. Economical quantities.
5. Possibility of obsolescence.
6. Possibility of deteriorations.
7. Availability of storage space.

When forms have been used, the question of records retention arises. There are four ways of storing records: in storage files, safes, by microfilm, and in the waste paper basket. Much has been written regarding the retention of records, how long they should be kept, and what means of retaining them should be employed. The approach to the subject should take into consideration the principal classes of records, namely, vital, important, useful and non-essential. Vital records mean records which are irreplaceable and are needed for reference. Important records include most operating and statistical records. The useful records classification covers records the loss of which might occasion some inconvenience but which could readily be replaced. Non-essential records are those records which can safely be destroyed within a reasonable time.

Having reference to the State of Pennsylvania, it may be said that, in general, any records leading to a commercial transaction should be kept for at least six years. A review of general practice of a number of corporations yielded the following indication of the length of time for which specific types of records are retained:

General journal	Permanently
General ledger	do
Detail ledger	do
Construction ledger	do
Payroll records	do
Tax Records—State & Federal	do
Cancelled stock certificate	do
Capital stock ledgers	do
Vouchers and cancelled checks	10 years
General correspondence	1 to 4 years
Customers' invoices	4 to 10 years
Vendors' invoices	6 to 10 years
Customers' orders	2 to 6 years
Purchase orders	4 to 8 years
Inventory records	4 to 10 years
Clock cards	2 to 6 years

Ample storage space should be provided for the retention of records or they should be microfilmed in order to save space. As indicated above, the retention of records depends upon their importance and legal requirements, and also on Government regulations.

Renewed Importance

Paperwork has been in the spotlight since the early days of World War II. Following the war and a return to competitive markets, the emphasis on cost has led to many and varied attempts to reduce paperwork and office non-production costs. Too often the emphasis has been on the elimination of costs rather than on the elimination of waste. This misplaced emphasis can frequently lead to merely apparent cost reductions which result in expensive wastes in other areas.

COMING ARTICLES IN THE **NACA BULLETIN**, MARCH, 1951

Management Accounting—2
Anglo-American Council on Productivity

Up-To-The-Minute Costs for Management Planning
by I. WAYNE KELLER

"Thirty Days Hath September"
by LAWRENCE P. JENNINGS

The Work of a Manuals and Procedures Section
by ROBERT W. GRIM

Using the Figures for Credit Appraisal
by ROBERT YOUNG

Cost Accounting for a Research Laboratory
by JAMES A. MC FADDEN, JR.

THE COST FORUM

AN INCENTIVE BONUS BASED ON SALES VOLUME

Editor, N. A. C. A. Bulletin:

THE PROBLEM OF SOLVING management-labor difficulties with respect to a basis of compensation which is not only acceptable to each group but is also equitable, is not as difficult as many believe it to be. Here we are not speaking of the base hourly wage rate which is determined by many factors, such as type of work performed, average rate in the area for the particular industry, state and Federal wage and hour regulations, manpower supply and demand, etc. Rather attention is directed in this letter to the further element of extra compensation.

The manner in which companies pay extra compensation seems to resolve itself into two categories, pension plans and incentive bonuses. Much consideration has recently been given to the former. The latter method of payment, greatly abused in many instances, deserves a degree of emphasis. It may be said at the start that, to be successful, an incentive bonus plan must be designed as to stimulate a competitive spirit among those covered. If this is not accomplished, the desired end result of increased production cannot be achieved at the most efficient cost level.

Furthermore, the method of bonus computation must be basically simple, so that all personnel can readily understand it. If calculations are complex and are not fully understood, doubt or even distrust will surely arise, substantially eliminating hope for production increases. Moreover, complex bonus computations impose a burden on the payroll department. For these reasons, a bonus should be based on data which is presently available and should be related to regular earnings at a readily calculable rate. It would probably be wise to compute it monthly rather than each week.

The particular plan proposed here could be called either a "sales" or "shipments" bonus. At bottom it is a profit-sharing plan without spelling it out as such to the employees. The first step in setting it up is to compute the break-even point of the company in terms of sales volume. To this figure should be added sales deemed necessary to provide primary net profits to cover dividend payments, income tax liabilities and a reasonable amount for future operating requirements and contingencies. On further sales, employee extra compensation or participation in profits begins.

The application of a flat percentage to the bonus sales (excess over previously computed break-even plus primary profit sales) would not produce the incentive spirit. This can be done by accelerating the participation rates with increasing units of sales dollars. Hence, a scale of increasing rates is applied to the bonus sales. For example, with a monthly base sales figure of $200,000 and actual sales of $265,000, eight per cent on payroll would be paid if the following scale were in effect:

IF SALES EXCEED MINIMUM REQUIREMENTS BY:	BONUS RATE FOR THE MONTH WILL BE: (% of payrolls)
Not over $20,000.	2%
Over $20,000 to $40,000.	4
Over 40,000 to 60,000.	6
Over 60,000 to 80,000.	8

Although the bonus is computed and paid on a monthly basis, employees can be informed either daily or weekly as to the progress of shipments each month. This may be accomplished by posting charts throughout the factory. The charts, while not disclosing the dollars involved or the base sales figure, can be scaled to any desired proportion to reflect the bonus potential at any given point during the month.

The foregoing plan has been used by several companies to the mutual satisfaction of both labor and management. That, after all, is the only true measuring stick of any incentive program.

EDGAR J. COSSETTE, JR., *Hartford Chapter*

WHEN THE SALESMAN MUST DOUBLE AS COLLECTOR

Editor, N. A. C. A. Bulletin:

IN CERTAIN TYPES of retail and small wholesale businesses, there arises the question of appropriately accounting for cash collected by the salesmen. Experience with the coal merchandising business points to the need for a simple but secure method for such cash receipts accounting and one which will relieve the salesman, on the whole, from the chore of being a collector and yet will not discourage the customer from making cash payments, when convenient, to the salesman (his closest contact with the business).

It is well-established that salesmen do not—and should not need to—give that meticulous attention to bookkeeping detail which the accountant must. The tested procedure described below offers the salesman a simple, clean-cut method for his handling of occasional collections.

Cash receipt books suitably bound with inexpensive cardboard covers were made up in sets of twenty-five pre-numbered triplicate receipts, with a supply of carbon paper furnished at the end of each book. The form was designed to a size easily carried in a man's coat pocket. The receipts were imprinted with the customary wording and provision for writing in names and amounts. The three parts were distinguishable as follows:

Part 1 — Customer receipt — perforated — white.

Part 2 — Cashier's copy — perforated — green.

Part 3 — Collector's copy — not perforated — remains in book — pink — on onion-skin paper.

On the face of each book's cover were printed the following brief instructions:

1. Have all checks made payable to the company.
2. Issue receipts to each customer from whom cash is received.
3. Turn in cash daily.
4. Present voided receipts to cashier daily.
5. Return book to cashier when all receipts contained in it have been issued or voided.

When the procedure was established, all concerned were appropriately notified through a general letter which included the following additional instructions:

1. The supply of receipt books is to be kept in the cashier's possession.
2. The cashier will keep a register of the books, including opening and closing numbers of receipts contained in each and will also keep a register of individuals to whom the books are issued.
3. The collector (salesman) will turn in Part 2 (cashier's copy of receipts) with his daily collections. The cashier will count the cash at once, initial Part 3 (collector's copy), and return the book to the collector.
4. Part 2 of the receipt (cashier's copy) will then support the cashier's entry in his record of cash received.

The plan places responsibility and control with the cashier. When first issue of the receipt books was made, the cashiers located at the several sales offices were advised to explain the plan to the salesmen individually. To avoid reflecting on the

integrity of sales personnel, the explanations were prefaced by comments on the value of the receipt book as a protection to the users and as a handy record of collections made. Good selling on the part of the cashiers did much to make the plan effective.

E. LEE CARMODY, *Twin Cities Chapter*

REDUCING WORKMEN'S COMPENSATION INSURANCE COSTS

Editor, N. A. C. A. Bulletin:

WORKMEN'S COMPENSATION INSURANCE costs are largely determined by applying insurance classification rates to the payroll. In other words, the premium cost is a percentage of payroll. It is the duty of the insurance auditor to examine payroll records and allocate payroll to the proper insurance classifications, so that a proper premium is developed. However, there are certain eliminations which can be made from total payrolls to compute insurance premiums and are allowable if the accounting records are set up for this purpose.

The first of these is excess overtime which means all remuneration paid as overtime or premium over and above the regular rate for hours worked. Shift differentials are considered as regular rate. Payroll records should be set up to indicate premium overtime, as this figure is useful not only in reducing insurance costs but for government reports and internal cost statistics. As related to workmen's compensation insurance, this deduction from subject payrolls was instituted to modify the effect on the rate structure of abnormal industrial activity during the war period. It has not been rescinded to date and will probably become a fixed deduction for insurance purposes. This deduction, however, is not allowed in the following states: Arizona, Delaware, Pennsylvania and Utah.

Another deduction from the payroll base for workmen's compensation insurance is the $100 limitation. Under this rule, all remuneration paid to any individual in excess of $100 per week, averaged over the total period of employment during the policy year, can be deducted in computing premium. Most companies take advantage of this deduction only on the executive or private payrolls, but it is applicable to all payrolls, providing proper records are maintained. The following states do not allow this deduction, Arizona, California, Delaware, Maine, Minnesota, New Jersey, Pennsylvania, Tennessee, Utah and Wisconsin.

In addition to these important deductions, certain companies classified as multi-class risks should make sure that their payrolls are departmentalized or coded to allow application of proper insurance classifications. An audit on this type of risk calls for the separation of "miscellaneous" payroll and its allocation to the rate classification developing the largest amount of payroll for the policy period, this classification being called the governing classification. Where proper payroll classifications exist, it may be possible to apply lower rates than the governing classification calls for.

J. A. KING, *Merrimac Valley Chapter*

PROMOTING THE COMPETITIVE SPIRIT AMONG PLANTS

Editor, N. A. C. A. Bulletin:

THERE IS AN OLD ADAGE to the effect that competition is the life of business. This saying is normally applied to competition among companies. However, there is no reason why the same thought may not be applied successfully to competition among manufacturing units within a company. This is especially true of companies producing a similar or identical type of

product at more than one plant location.

For example, in our company, a tile flooring product is manufactured in four plants. These plants are located in widely scattered areas: the east coast, central states, the south, and west coast. By comparing manufacturing costs experienced in these four plants, we have helped to promote efficiency and cost reduction. However, in order to compare the manufacturing costs experienced in any plant with the costs experienced in the other plants, it has been necessary to eliminate for this purpose certain uncontrollable cost factors peculiar to the locale of each manufacturing unit.

The two major elements of uncontrollable costs due to location were found to be: (1) differences in price paid for raw materials and (2) differences in wage rates among areas. There are many lesser uncontrollable items of cost peculiar to locality which, if significant, are taken into consideration. Some of these lesser types of costs are: prices paid for and kind of fuel, power rates, local taxes, etc.

In order to place all plants on an equal footing for comparison purposes and to eliminate the effect of uncontrollable location factors, we established one plant as the basic or index plant. Any one of the four units could have been selected for the purpose. We chose the one servicing the greatest number of customers. The purchase prices of raw material of the three other plants were then adjusted to those of the basic plant. The wage rates were likewise adjusted. The same procedure was applied to the less significant categories of uncontrollable location costs where these were considered to be sufficiently important. After these adjustments for location factors, the costs represented, for all practical purposes, a sound basis for measuring the relative manufacturing efficiency of each plant.

This type of comparison, if presented in the proper manner, should instill a definite competitive spirit in each plant organization. It also should be useful to top management as an aid in properly judging the performance of plant management personnel.

G. H. GANTZ, *Lancaster Chapter*

SCRAP REPORTING IN PORCELAIN PRODUCTION

Editor, N. A. C. A. Bulletin:

THE FLEXIBILITY OF REPORTS becomes increasingly important in a small plant with the greater demand on management for decisions on the spur of the moment. It is necessary for management personnel to have at their fingertips accurate and up-to-date information for guidance in making a practical and profitable analysis of each problem.

In the manufacture of porcelain, there are many conditions which are of a variable nature and may, if not constantly checked, become very costly in the form of scrap. Through the use of the "scrap" or "loss" reports to be described, immediate action can be taken to correct any of the out-of-line processes or groups of processes within a given product type. These reports are forwarded to factory management as well as top management at the close of each month. There are also daily reports which point a finger at out-of-line processes or groups of processes. Coupled with the monthly reports, they serve to give the overall view which is needed by factory management to stimulate corrective measures and at the same time forestall serious interruption of a well-planned production cycle.

In most instances factory management, including supervisors, is more familiar with scrap or loss in terms of quantity

than dollar value. Although the value of such loss is very important, it seems more comprehensible if related to quantity and for this reason, the reports are expressed both in dollars and in per cent of quantity loss. The procedure follows:

(1) Through the use of tabulating equipment, production reports are available at the close of each month. Production figures and related losses at each operation or group of operations, are posted to an individual part number card. This card thus gives detailed information regarding each part within a product type. The data afforded is very helpful in planning production on repeat orders as well as in showing scrap trends for any given part within a product type. It may result in engineering design changes or manufacturing method changes as corrective measures.

(2) The production and scrap figures mentioned are further grouped by operation or groups of operations and classified by product type, so that the trend by type of product at the various stages of processing may be shown. Bogies or standards have been established for these stages so that actual scrap performance may be shown against the expected. This creates an incentive for the supervisors to constantly keep improving scrap performance against the standard and gives a practical and fundamental method of showing accomplishment.

Having classified the loss by part number within a product type, the costing is a very quick and simple job, requiring only an extension of the standard cost of the in-process loss. Totals are available in the same relationship by monetary value. Thus, a two-purpose report is available, showing quantity loss in per cent and also dollar value loss which is used by the general accounting department in preparation of the profit and loss statement. In addition, there is the advantage of having on hand detailed information regarding scrap on specific parts. This is used by the production and scheduling departments as an aid in foreseeing difficulties which, if not provided for, would cause delay in shipping.

J. W. CANNAN, *Rochester Chapter*

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